GONORRHEA

IN THE MALE AND FEMALE

A BOOK FOR PRACTITIONERS

By

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THIRD EDITION REPRINTED WITH NEW CHAPTERS ON SULFANILAMIDE AND ITS DERIVATIVES AND ON GONORRHEA IN IMMATURE FEMALES

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TO

RANDLE C ROSENBERGER, M D

IN

GRATEFUL APPRECIATION

OF

FORTY YEARS

OF

FRIENDSHIP

PREFACE TO THE THIRD EDITION

THE decidedly flattering reception of the first two editions of this book, together with the great advances in our scientific knowledge of gonorrhea, seem to justify the appearance of a third edition. In preparing this edition, the aim has been to retain as nearly as possible, the size of the last edition. Much that was not deemed necessary for the present edition has been deleted and the space thus gained has been used both for a fuller discussion of much that has been considered basic and for the presentation of a wealth of new material.

In most of those places where the older material has been retained, it has been necessary to make extensive changes in order to bring it in line with modern thought. So great has been this need that there are but a few of the older chapters that have not been greatly amplified or entirely rewritten. The addition of sixteen entirely new chapters to the main body of the book has been justified by the introduction of such things as prolonged hyperthermia sulfanilamide and its derivatives, and the estrogenic hormones into treatment by the advances in cultural methods by the need for better technic in both diagnosis and the tests of cure and by the many other things that have been added to our knowledge Aside from these, the "National Campaign for the Control of Venereal Diseases" has brought out many things that deserve the greatest consideration if we would overcome much that is neither to our credit nor to the best advantage of our patients and those with whom they may come in contact. In a discussion of these things, a third section of eleven chapters has been added upon "The Medical Profession and Gonorrhea Control," in which many of our sins of omission and commission are pointed out and suggestions for their correction made. Many new illustrations charts, and tables have been added.

In bringing the book up-to-date, every effort has been made to cling to the safe and sane in the midst of much that is not

finally settled today, as much attention has been paid to the therapeutic shadows as to the highlights The constant aim has been to clarify much that is causing confusion—in order that the physician may be furnished with a safe working-basis for the new

In the writing of the present edition, I have been ever conscious of the great change that has occurred since the first appearance of the book in 1928 In those days, one's reading public was in no sense critical about what might be written on this then, much neglected disease Today, it is highly critical, and refuses to be led far against a tide of orderly science, instead of following those who make a great noise, it is developing the habit of doing its own thinking and it is thinking through No longer can men feel free to write almost anything about this disease without fear of challenge. On all sides there are those who will analyze and pass judgment. This is as it should be with a disease that affects so many millions of human beings

In offering the present effort to an awakened profession I am hopeful that it may in its small way serve a helpful purpose. My thanks and sincere appreciation go out to all of those who through the years have stimulated me by their interest and kindly treatment to the many whose writings have helped me so greatly to those who kindly allowed me to use the illustrations accredited to them and to the publishers for their countless courtesies

P S PELOUZE

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PREFACE TO THE FIRST EDITION

THIS is not a text book upon gonorrhea, nor has there been any thought of making it so It is just a simple story simply told. Unhampered by the text-book writer's constant fear of leaving out something that his reviewer would expect to find the reviewer has been forgotten and the story told as my experience has taught it to me The text-books are needed, as the encyclopedias are needed, as repositories for the known facts. There is also need of books that offer more freedom of discussion and wherein these data can be arranged in a manner more easily understood. Most text-books upon gonorrhea leave us with a feeling of confusion and a desire to have the story told in a simpler way with more about the disease itself as it really is. We would be told in a way we can understand how to treat it—just a simple good plan of treatment and what to expect of it These are the things I have tried to do

I well recall my own ignorance of gonorrhea and its treatment during my years of general practice, and how little real enlightenment was to be obtained from careful readings among the text books. They had the facts—too many of them—but these were so arranged that try as one might, it was almost impossible to visualize and co-ordinate them When it came to the question of treatment the vast array of good things to do was so dazzling as to afford puzzling confusion rather than real guidance With so many good plans of treatment suggested any choice seemed a good one There was too much choice and, in an effort to cure the disease more quickly than anyone should expect so many methods often were tried that no plan had a real chance to do good

In those days medical men freely voiced this confusion upon the subject so that there was no reason to think my impression was exceptional Subsequent years of contact with countless out spoken general practitioners and urologists have given no reason to think that conditions have changed greatly in this regard. The same general confusion about gonorrhea and its treatment still exists the same foolish things are thought and done and the public pays in more ways than one At least 90 per cent of those afflicted are treated by men who frankly confess to themselves, and to their medical companions that they really have but very meager knowl edge of the scientific facts of the disease and of the precise methods of its most effective treatment.

If such things be true, and that they are can be shown by very little inquiry among physicians there can be no question regarding the value of retelling the story so that one really can visualize what the disease does and what we must do if we would be of most efficiency in its cure To this end an effort is made in the following pages so to correlate and arrange our knowledge of the disease that it can be easily understood to unravel the endless skein of pseudo-science that has been spun about it to strip it of its over load Hitherto the available facts have been obscured and weighted down by countless misinterpretations discoverable or deducible facts have been neglected Consequently treatment has blundered along for years out of mind It is high time it should find the sound and well-defined course that is open to it

The literature particularly that from the laboratory teems with truths which when arranged in their proper places and inter preted in the light of our clinical observations show that we have often been in error at times foolishly so In the hope of correcting some of these things I have not hesitated to take truths where I have found them and to interpret them as my experiences with the disease have taught me that they should be interpreted In this it is possible I have been wrong at times If so there will be the more

grounds for discussion or difference of opinion and this is a disease that needs much more discussion With a thousand good debates upon gonorrhea the medical world might awake from its prolonged lethargy regarding it and we should then know far more about it when the smoke of battle had cleared away The public might at least hear the word gonorrhea, as it has the word syphilis and would become wise enough to demand of the profession more knowledge and better treatment than hitherto offered it Such a result would work much good Publicly unspeakable and medically outcast, gonorrhea has limped through the years a veritable nobody's child It is a serious disease and it needs serious attention

In the present series of discussions no effort has been made to include all of those subjects in our modern text-books. To do so would result in more confusion than clarity There is no need to repeat those matters of technic that are so well described elsewhere The highest type of urology cannot be practised without the use of both the cystoscope and the urethroscope. The immense value of these instruments is beyond question and the technic of their use is better described than I could attempt. They are however instruments that only should be used by those specially trained to use them They can do more harm than good in the hands of those who have not perfected themselves in their use Their imperative need is limited to such a very small percentage of the cases herein discussed that they have been mentioned to condemn their too frequent use at times when no instruments should be used

One who reads these pages with a closed mind will find much to criticise for there has been no hesitancy about stepping out of beaten paths wherever the higher ground or even virgin country has seemed to hold the paths of truth It has been found necessary often to show a cruel disregard for some of the idols that have been worshipped for years. This is one of those instances wherein the hoped-for end amply justifies almost any means. If these pages

can do even a little toward bettering our understanding of what is unquestionably our saddest and perhaps our most prevalent disease I shall be well repaid for all the effort they have cost and for any criticism they may bring

It is with sincere appreciation that I acknowledge my indebtedness to all of those who through their writings or suggestions have helped to lay the foundation whereon these pages are based It is an equal pleasure to acknowledge my debt and express my thanks to Dr F S Schofield for originally having urged the writing of the book, as well as his continued interest in its preparation to Mr S C Childs whose generosity made possible much of the research work that helped so greatly in the understanding of a number of questions regarding the disease to Mr Erwin F Faber for the great interest shown in the preparation of the illustrations most of which are his work and to Mr R. W Greene of the W B Saunders Company for his many kindnesses and courtesies

P S PELOUZE

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GONORRHEA IN THE MALE AND FEMALE

INTRODUCTION

When the first edition of this book was written the general clinical knowledge of gonorrhea and its treatment were not of a nature to give much warrant for boasting or pride. The printed word regarding the disease was contradictory to the point of confusion. Largely it was based upon what our forefathers in medicine said and thought before Neisser discovered the gonococcus and Finger described the pathologic processes it engendered Despite the foundation structure that these and other workers supplied the foundation was ignored and men talked, wrote and did largely as they had before. They carried down through the years the sayings and beliefs of those old masters of the almost purely clinical days, regardless of the fact that many of them were in direct contradiction to the known bacteriologic, pathologic and biologic characteristics of gonorrhea.

No one with even a smattering of knowledge regarding these scientifically proved things could make a large proportion of the old inherited teachings fit into our modern conception of the fac tors underlying infectious diseases. And, most certainly he could not apply them to the easily provable characteristics of gonorrhea itself The moment he approached the consideration of this disease from the standpoint of modern views he could not help discovering that, largely we were on the wrong track In our lack of real interest in the disease and those who had it, we had skipped the switch and continued along what used to be the main road We had placed our most valuable cargo onto an almost forgotten siding and gone on down the rails with brakes off and whistles tooting, disregarding stop signals and important stations. Smoke soared, steam hissed and winds blew and when it was all over we had succeeded in reaching almost a scientific dead end.

Overwhelmed by the pathos and futility of such a journey the writer scolded his way through several hundred pages of text, waving stop signals, calling names poking ridicule, moaning distress exhibiting atrocities and doing other equally unattractive things in the hope of checking this onward rush. He used harsh words from which he tried to ease the hurt with others of a more kindly nature. He stormed he coaxed he, figuratively caressed and almost, he wept on paper that a profession he revered might see the light that stood glaring at it from high mountains. And, as he rereads these fumings in the light of mind more mellowed by the passage of eleven short years, he wonders that a highly sensitive profession ever let him survive. The fact that they did and continued to shower upon him kindliness and friendship is to their everlasting honor and glory and, if he survives until the "rocking-chair gets him" he will have many things for pleasant recollection.

Now with the exception of one thing the picture entirely has changed. Our really valuable cargo is an integral part of the scientific train and we have dropped most of the cars that gave us dead weight and no attractive advantage. We are watching and obeying signals and we safely are headed toward goals that mean much to our fellow men. Thus, in the first two sections of the present train one finds few passengers who have no right to ride. So few in fact that there is no great need for an avalanche of scolding When we come to that third section, however, we find much that would justify critical analysis and perhaps a little of the old medicine that so often brought New Englanders to the "ducking-stool." If in that section, the third section of this edition, the writer seems a bit critical at times it is not that he does not love his brothers but solely because he believes that there are some things that require frank, straightforward treatment if men are to see and heed.

Science has moved on and with the march of science other things have moved on as well There have come to be many groups of high-minded gentle-souled creatures who gloriously are imbued with the belief that they are their "brothers keepers." They are not what might be called "social busybodies" but are thoughtful earnest, courageous individuals whose high purpose is to do their parts in the making of a better safer kinder world

They are not long haired reformers, nor are the moves they represent, as are so many of the day, symptoms of a world at economic unrest. They are the social applications of Christian spirit. They grasped the torch and while we, "their companions, slept, were toiling upward through the night."

Busy at improving our own house of science and all of the furniture that is in it, we have not realized fully how rapidly and surely the world outside its often narrow confines has moved toward the correction of countless evils and misfortunes. It is our history that social moves often have caught us mentally and temperamentally unprepared to follow readily with dignity and good judgment the course that our high calling should have prompted us to take. And today among all of the others that confront us there is one that we are singularly ill-fitted in our present attitude, to follow There is laid at our door, largely from the outside a national campaign for the control of the so-called venereal diseases. A campaign that, above all things, wants to go along with us in perfect accord but that undoubtedly will go on without us if we fail to respond. That we should fail utterly is unthinkable. But we never should lose sight of the fact that we are, by the nature of things, more fitted to be the leaders than the followers, that there are many gradations between signal success and dismal failure and that there is far more of what should be in success than in failure.

As the writer with years of experience on both the medical and social sides of the questions involved, analyzes our present state of mind and action, he finds much that is not conducive to signal success, much that we must overcome, and overcome quickly if we are to be of the service that, of right, we should be. If as he makes this analysis on paper he at times seems to be a bit overcritical he hopes that his scoldings may be met with as much tolerance as were his former ones and that the effort will be viewed as his perhaps misguided way of leading us to see ourselves as many see us Certainly he has no desire to be smart or unkind and even more certainly he has no wish to offend. Largely he has trod a comparatively lonely road in social fields and craves the companionship of his fellows.

It is not the writer's intention to produce in the third part of

this book a treatise upon what has come to be called 'Social Hygiene." Others, notably Nelson and Crain[1] and Long and Goldberg[2] recently have attended to that matter far better than he possibly could hope to do It is his intention to confine himself solely to those phases of the matter that are of vital interest to us as physicians things that often stand as our errors of omission and commission, in the hope that we may correct some faults we have that are none too much to our credit.

Gonorrhea, Syphilis and Public Health, The Macmillan Co New York, 1938.
Social Hygiene, Lea and Febiger Philadelphia, 1938.

Part One

GONOCOCCAL INFECTIONS IN THE MALE

I. APPLIED ANATOMY

In an understanding of few human diseases is it more essential that one have a thorough knowledge of the structures involved than is the case with gonorrhea of the urogenital tract. Such a knowledge is more accurately obtained by a careful dissection of the parts In this way one gains a better idea of the actual size, arrangement and functional activities of the various structures that play such a prominent part in every phase of the disease. He who gains his first knowledge of them from the text book and then turns to the dissecting table usually is surprised at the extent to which he must alter his ideas as to size. For, almost invariably, he has visualized them as many times their actual size, though the textbooks have given their measurements in inches or centimeters.

Added to a knowledge of anatomy must be a familiarity with the surface histology of all the linings of both the urinary and genital conducting structures. The gonococcus shows a striking predilection for certain types of mucous membrane and, unless one knows the locations and varying degrees of susceptibility of these cellular structures and where they are he can neither understand the disease nor intelligently apply treatment.

Further there is needed a clear visualization of the functional mechanism of the muscular controls of both systems if one would understand the reasons for many things that, otherwise, make the disease and its symptoms matters of great mystery Upon such depend the possibility of disease localization and the ability to follow its course.

By the nature of things, our study in the male has to do almost entirely with the bladder the urethra and its adnexa. It is rare, indeed that gonorrhea passes above the bladder or if it does

the ureters and kidney pelves are so richly endowed with curative powers that such infections are quickly and spontaneously cured except in those extremely rare instances wherein the gonococcus has gained entrance into an upper urinary tract that becomes occluded immediately thereafter

Fig. 1.—Diagrammatic outline of the lower urogenital tract

Viewing the middle and lower reaches of the tract we see a dilated portion the bladder emptying its contents through an elongated channel, the urethra from which small mucous channels extend into what we have come to call the adnexa. We see this elongated channel closed except during urination and seminal

emission, by one of the encircling muscles or sphincters One of these, a decidedly weak one, is placed at the bladder outlet and the other, having far more strength, from 3 to 4 cm. distal to the vesical opening The second sphincter marks the dividing line between the anterior and posterior portions of the urethra and, by its tonic contraction makes the anterior portion practically a blind pouch between urinations. This tonic contraction also serves us well from the standpoint of local treatment efforts as it

Fig. 2—Diagrammatic midsection view of the lower urogenital tract.

gives us the possibility of injecting substances into the anterior urethra for the treatment of it alone without any of the material escaping into the posterior portion unless too much fluid has been used or too much force applied. It has been determined by many measurements that the average anterior urethra has a capacity of 10 cc. of fluid. One, however should not mistake average capac ity for safe capacity in those patients with a penis smaller than average. For they are the low capacity ones that help to make the average fall to 10 cc Thus from the standpoint of retaining

fluids in the anterior portion without having any of them pass through the distal sphincter into the posterior, it is safest to inject not more than 6 cc. of fluid in any of them. With this safer quantity it is obvious that the entire anterior urethral mucous membrane is brought into contact with the medicament by tissue pressure alone, no matter how capacious may be that portion of the canal

From the standpoint of the drainage of purulent products, *man was not treated too kindly in the construction of his posterior* urethra. Here we see a section of the canal lying between two sphincter muscles and dependent upon either urination or the forcing of its weaker constriction for the emptying of purulent products. We find emptying into it some rather important mucous channels which, because of this faulty structural arrangement, are greatly menaced by gonococcal or other infections of this portion of the urethra. This is particularly true of those channels leading into the prostate gland, and it is seldom, indeed that gonococcal infections of the posterior urethra fail to pass into this gland. Such a frequency of infective extension does not apply to the seminal vesicles and epididymes, however Gonorrhea rarely passes for great distances through long narrow mucous channels by continuity of structures. For this reason some form of back pressure either of urine or irrigating solution must serve as a transferring medium in most infections of these structures As these influences will be discussed at length in a consideration of both seminal vesiculitis and epididymitis there is little need for elaborating upon them at this juncture.

In its greatest simplicity the lower urinary tract in the male is a double-bulbed syringe The larger bulb the bladder, is connected with the smaller bulb the bulbar portion of the anterior urethra by a short tube comprising the posterior and membranous portions of the urethra. This inferior or distal bulb superimposes the true barrel of the syringe the anterior urethra, at the distal end of which is the nozzle the smaller-calibered external urinary meatus. Not only does it resemble a double-bulbed syringe in outline (Fig 1) but it has about the same action The larger bulb forces its contents through the urethra by the contracture of its musculature or by pressure of the abdominal contents and

muscles. After this has been accomplished, the lesser bulb contracts to force out any fluid left in that portion of the barrel.

The Bladder.—The urinary bladder is a muscular bag that varies in size in different individuals. It is capable of forcible contraction when inflamed or irritated, which contraction not uncommonly raises intravesical pressure to such a point that the internal sphincter is forced open and the posterior urethra is subjected to a force that may be the means of disease spread into its adnexa. Aside from such complication-producing contractions, our interest in the bladder in this disease largely is confined to that triangular portion at its base which we call the trigone. As later will be discussed, gonorrhea seldom passes beyond the trigone by virtue of the fact that the gonococcus rarely penetrates mucous membranes of the type found in the general bladder wall.

The trigone, bearing a different type of epithelium, is that portion of the bladder base that would be bounded by lines drawn from ureteral orifice to ureteral orifice and from these points to the vesical outlet. Gonococcal infection of this portion of the bladder occurs in practically every case wherein the posterior urethra becomes infected.

The trigone with much accuracy might be termed the push button of the bladder for it is the stretch placed upon it by the distending bladder that usually gives the first conscious call for urination. Even instrumental pressure upon it when the viscus is entirely empty causes the same desire. Upon the slightest inflammation or irritation of this expanse of mucous membrane its message-sending is stepped up and it often reaches a point where even the presence of a few drops of urine in the bladder will cause such an excessive excitation as to throw the entire viscus into forcible muscular spasm. The extent of these reactions however differs with different individuals, as differs the nervous instability of the patient. Some more stolid individuals experience little difficulty even in the presence of violent-appearing inflammations, while in others life is made almost unbearable by even congestions of the trigone.

The Posterior Urethra.—Passing almost perpendicularly in the standing position from the vesical outlet, the posterior urethra extends for from 3 to 4 cm. to the posterior layer of the triangular

ligament. As has been pointed out, its drainage possibilities are of an extremely poor order, a fact that has much to do with the seriousness of its infection. When it becomes filled with purulent products they either force their way through the vesical sphincter into the bladder or lie there until urination flushes them out.

In the center of the floor or posterior wall of this portion of the canal lies an elongated, spongy mass of tissue the verumon tanum Through it pass the ejaculatory ducts to open usually, on their own sides of the sinus poculans, a shallow mucous pocket passing into the center of the mass of tissue. Into the sulci to each side of the verumontanum empty varying numbers of minute

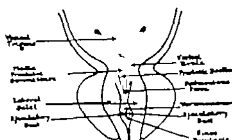


Fig 3 —Posterior urethral orientation.

ducts from the prostate gland The openings of these ducts are so small that they usually cannot be seen even under the magnifi cation of the cystoscopic lens. Some of these openings also are found to each side of the midline on the anterior surface of the median lobe of the prostate gland, the so-called declive.

The *posterior urethra is entirely surrounded by the prostate* gland but, despite this is quite distensible. It displays a decid edly low order of nervous sensibility—so low in fact, that even caustic substances can be applied to its surface without great discomfort to the patient. This is in marked contrast with the sensitiveness of both the trigone and the anterior portion of the urethra. The mucosal surface is readily penetrated by the gonococcus but displays rather a high order of curative response This, however is decidedly interfered with by feeding infective foci in the prostate gland

The Membranous Urethra.—Entirely within the grasp of the distal sphincter the cut-off muscle this portion of the canal is of

little importance from an infective standpoint beyond the fact that it serves as a slight barrier to the ready passage of infection back ward from the anterior urethra It exhibits no glandular off shoots and its mucous membrane being firmly attached to the subjacent

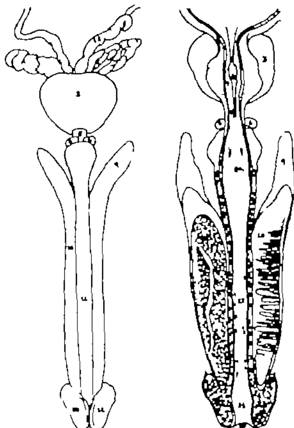


Fig. 4—Posterior and anterior aspects of the urethra and its adnexa 1 Ampulla of the vas deferens. 2, Seminal vesicle. 3 Prostate gland. 4 Posterior urethra. 5 Membranous urethra 6 Cowper's glands. 7 Openings of Cowper's ducts. 8, Bulbar portion of the anterior urethra. 9 Crux of the corpus cavernosum. 10, Corpus cavernosum. 11 Corpus spongiosum. 12, Glans penis. 13, Penile portion of the urethra. 14 *Fossa navicularis* 15 *External urinary meatus.*

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The Anterior Urethra —This portion of the urinary canal ex

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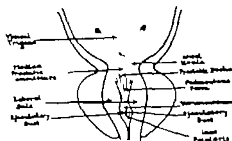


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The Membranous Urethra—Entirely within the grasp of the distal sphincter the cut-off muscle this portion of the canal is of

little importance from an infective standpoint beyond the fact that it serves as a slight barrier to the ready passage of infection backward from the anterior urethra. It exhibits no glandular off-shoots and its mucous membrane being firmly attached to the subjacent

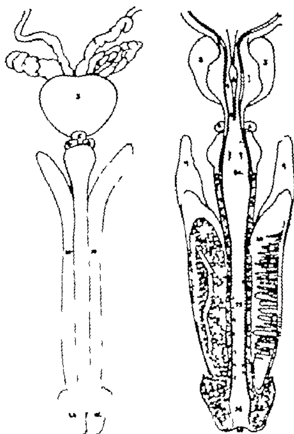


Fig. 4.—Posterior and anterior aspects of the urethra and its adnexa. 1, Ampulla of the vas deferens. 2, Seminal vesicle. 3, Prostate gland. 4, Posterior urethra. 5, Membranous urethra. 6, Cowper's glands. 7, Openings of Cowper's ducts. 8, Bulbar portion of the anterior urethra. 9, Crux of the corpus cavernosum. 10, Corpus cavernosum. 11, Corpus spongiosum. 12, Glans penis. 13, Penile portion of the urethra. 14, Fossa navicularis. 15, External urinary meatus.

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The Anterior Urethra.—This portion of the urinary canal ex

tends from the anterior layer of the triangular ligament to the external urinary meatus. Its average length is about 15 cm. and its average circumference is that of a No 24 to 28 French urethral sound It is surrounded by the corpus spongiosum which, at its distal extremity, expands into a hood like structure, the glans penis (Fig 4)

For purpose of description the anterior urethra usually is divided into three portions, the bulbar, the penile and the fossa

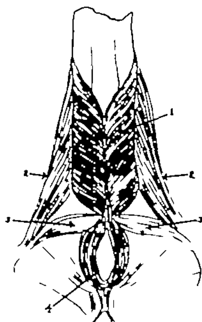


Fig. 5—Muscles of the bulb and perineum. 1, Bulbocavernosus. 2 Ischiocavernosus. 3 Transversus perinei. 4 Sphincter ani externus

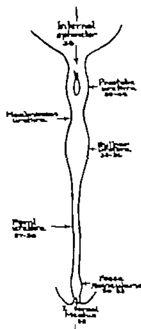


Fig. 6.—Diagram showing the average calibers of the various portions of the urethra.

navicularis On both the floor and the roof of the first two are the openings of the glands of Littré and the crypts of Morgagni while on the roof of the fossa navicularis occurs a larger mucous crypt, the lacuna magna. The bulbar portion of the canal extends from the membranous urethra almost to the penoscrotal angle. It is the most dilated portion of the entire urethra and into its floor on each side of the midline enter the ducts from Cowper's

glands. The bulbar urethra is surrounded by a decidedly wider part of the corpus spongiosum the bulb, from which it takes its name. The bulb in turn, is surrounded by a herring-bone muscle, the bulbocavernous muscle (Fig. 5) the function of which is to contract at the end of urination to expel the several drops of urine that otherwise would remain there and slowly dribble out as the result of tissue pressure alone. It is not uncommon for individuals to fail to bring about this muscle contraction and, because dribbling after urination is rather generally assumed to be a pathognomonic symptom of urethral stricture, they often are treated for strictures that do not exist. Contraction of the bulbocavernous muscle likewise, occurs at the moment of ejaculation giving propulsive force to the seminal fluid.

The mucous membrane of the bulbar urethra is rather closely attached to the subjacent structures, and is highly susceptible to stricture formation. The greater frequency of such strictures in this portion of the canal has been attributed to its poorer drainage possibilities A better explanation is that this is the portion of the urethra most traumatized by the injudicious passage of urethral instruments in the presence of gonorrhea. For it is much in evidence that gonorrhea of itself rarely if ever causes stricture formation. It is the round-cell infiltration of trauma added to the pathology of gonorrhea that serves as the precipitating factor.

The penile urethra extends from the anterior extremity of the bulbar portion to the fossa navicularis. It is of the same general structure as the bulbar portion and with it exhibits the greatest degree of susceptibility to gonococcal infection of any portion of the canal, as well as the poorest order of curative response.

The crypts of Morgagni are small mucous depressions that are not true glandular structures The glands of Littré on the other hand are definite tubular glands passing deep into the mucosa and often, well into the corpus spongiosum. Those in the front portion of the canal run from their openings from before backward, while many of those in the bulbar portion run in the reverse direction from behind forward a fact that makes their topical treatment practically impossible by other means than perhaps electric destruction This portion of the canal is highly sensitive to nerve irritations and usually refers its sensations to

the fossa navicularis Generally it interprets pain as cutting or burning in character

The fossa navicularis comprises the distal centimeter of the canal Its mucosa differs from that of the rest of the anterior urethra in that it is covered by squamous cells that are closely attached to the subjacent glans On its roof as has been said is the lacuna magna, and at its distal extremity is the narrowest portion of the entire canal the external urinary meatus At its junction with the penile portion there is a slight narrowing the

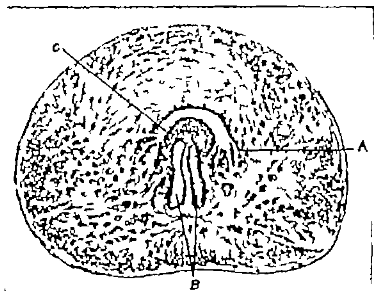


Fig 7—Cross-section of the prostate gland at the level of the verumontanum *A* Ducts of the prostatic acini *B* Ejaculatory ducts. *C* Posterior urethra.

valve of Guérin. At times this is a veil of tissue bearing an opening of decidedly small caliber and causing the same back-pressure effects as a true stricture.

The Prostate Gland.—This large compound tubular gland as has been stated entirely surrounds the posterior urethra into which its acini empty through a number of openings Though commonly described as of the size and shape of a horse-chestnut, it frequently shows wide variations of both It, also normally varies in size at different ages in the same individual. While most prostates, when digitally palpated per rectum do show a median

furrow much like that of the horse-chestnut, it is by no means uncommon to encounter those that bear no such resemblance. Many are normally flat and some extend much farther upward on the sides than they do in the midline.

In youth the gland is rather small and gradually increases in size until at fifty years or above it normally may reach three or four times its original size. The prostates of large, heavy-boned men usually are definitely larger than are those of their smaller brothers



Fig 8.—Diagrammatic cross-section of the prostate gland. 1 Surrounding capsule. 2 Anterior lobe. 3 Collapsed urethra. 4 Utricle. 5 Ejaculatory duct. 6, Cross-cut follicular canals. 7 True prostatic substance. 8, Large blood vessels on posterior surface 9 Capsule. (After Toldt)

The consistency of the gland varies greatly in different individuals. In some it may be so soft as to feel like spongy tissue, while in others it may be so firm as to arouse a suspicion of possible malignant change It also varies much in mobility in different men.

The bulk of the gland is composed of the so-called lateral and median lobes only a small portion of it being made up of the anterior and posterior lobes. The acini are imbedded in a thick stroma of connective and muscular tissue and the entire structure is enveloped by a heavy coat of fibrous tissue The ejaculatory

ducts pass diagonally downward and forward through the prostatic substance between the posterior and median lobes.

The Seminal Vesicles—The seminal vesicles lie beneath the base of the bladder with their lower extremities in contact with the upper aspects of the lateral prostatic lobes. From slightly to their own sides of the midline they pass diagonally upward and outward with their upper extremities underlying the point where the ureters emerge from the bladder wall. Between them lie the dilated portions of the vasa deferentia, the ampullae.

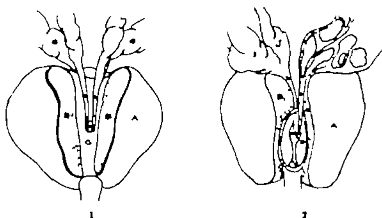


Fig. 9.—Diagram to show the relations of ejaculatory ducts to the posterior urethra and the prostate gland. 1 A section has been removed from the posterior portion of the prostate down to but not into the urethra. (After Toldt) 2, A section has been removed from the anterior portion of the prostate and the anterior urethral wall. (After Spalteholz.) A, Lateral lobes of prostate. B Cut surfaces of the prostate. C, Urethral wall. D Sinus pocularis (colliculis) E, Ejaculatory ducts. F Ampullae of the vasa deferentiae. G Seminal vesicles.

The individual vesicle is a convoluted sac showing many mucous infoldings. Its lining of tall columnar cells rests upon a dense muscular coat. At its lower extremity is an opening at the valvelike junction of the ejaculatory duct and the ampulla of the vas deferens. This mechanism is so arranged that fluids coming through either the vas deferens or the ejaculatory duct flow into the vesicle before they can escape into the other canal

For drainage the seminal vesicle is dependent upon ejaculation or perhaps a true overflow of retention. Its greatest protection against gonorrheal extension from the posterior urethra

is due to the length small caliber of the ejaculatory duct and the previously stated fact that infection seldom travels through such channels by continuity of surface. This is a fortunate circum stance which in the writer's opinion, limits seminal vesicular infection in this disease to not more than 1 or 2 per cent of the cases. Its significance will be discussed further in the chapter on Seminal Vesiculitis

The Vasa Deferentia—These mucous channels, approx imately 45 cm. in length, pass from their dilated portions the

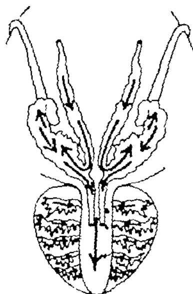


Fig. 10—Diagrammatic outline of the prostate gland, seminal vesicles, and ampullae to illustrate the normal directions of their fluids

ampullae between the ureters and the bladder wall, curve over to the internal inguinal rings and pass down to the epididymes. Because of their length and narrowness and protection by the long narrow ejaculatory ducts they rarely transmit infection by continuity of structure When this does occur however the great swelling of the vas deferens where it passes over the ureter has a tendency to cause some interference with drainage in the cor responding side and for a short time rarely more than a day there may be symptoms of acute ureteral block.

The Epididymes—These structures attached to the lower posterior and upper surfaces of the testes, are composed of countless convolutions of a single tubule. Each tube receives efferent tubules from the testis at its upper pole and merges into the vas deferens. It has been shown by roentgenographic studies that opaque media injected into the vas deferens pass only a short way along the tubular convolutions of the lower pole, and that it is not possible to force them through the entire length of the epid

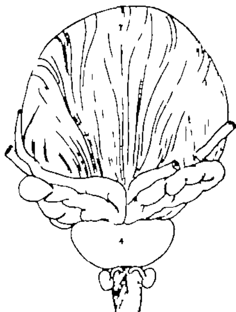


Fig 11—Diagram of the posterior surfaces of the bladder and bulbar portion of the urethra. 1, Ureters. 2, Vasa deferentia and ampullae. (Note that the vas passes between the ureter and the bladder wall.) 3 Seminal vesicles 4 Prostate gland 5 Cowper's glands. 6, Bulbar urethra 7 Bladder wall

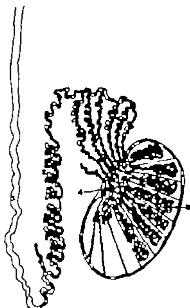
idymal tube even under great fluid pressure. Thus in gonococcal infection the true tubular gonorrhea is confined to the lower pole The peritubular inflammation of which there usually is much, extends throughout the length of the epididymal mass however

The Testicles—So far as gonorrhea is concerned the testicle itself probably never is involved. As a result of close pathologic studies the terms gonorrheal orchitis and epididymo-orchitis long

since have fallen into disuse. Upon the rarest of occasions, acute epididymal swellings may interfere so greatly with testicular circulation as to cause sloughing of the organ or later atrophy

Cowper's Glands—These two small, compound racemose glands lie between the two layers of the triangular ligament, each to its own side of the membranous portion of the urethra. Their ducts penetrate the anterior layer of the triangular ligament and pass downward forward and inward through the bulb of the

Fig. 12—Diagram of the lower seminal system. 1 Vas deferens. 2 Epididymal tubes. 3, Vasa efferentia 4 Rete testis. 5 Lobular structure of testis. (After Toldt.)



corpus spongiosum to empty on the floor of the bulbar portion of the anterior urethra at points about 2 cm. distal to the bulbomembranous junction. The ducts are extremely narrow and their openings are so small that they are invisible even under urethroscopic magnification.

Paraurethral Ducts—The occurrence of minute mucous channels that extend in varying directions through the glans penis is by no means rare. Usually these ducts empty through almost microscopic openings at a point in close apposition with the ex

ternal urinary meatus They offer ideal points for the prolonged colonization of the gonococcus. Occasionally there is a duct passing from the upper portion of the urinary meatus which parallels the urethra for varying distances

The Parafrenal Glands —These tubular glands members of the Tyson group of glands, pass from each side of the frenum into the cellular tissue below the corpus spongiosum They do not connect with the urethra unless abscess formation breaks through the intervening tissue, but obtain their infections via the preputial sac. When infected they usually abscess and, unless carefully

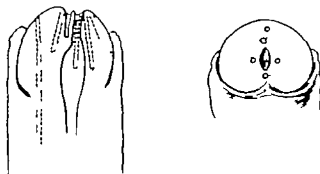


Fig. 13 —Diagrams to show the more common locations of the openings of para urethral sinuses and the courses pursued by these abnormal mucous channels.

treated have a tendency to retain infection for long periods of time.

The Penile Integument —The skin of the penis and particularly that of the prepuce is underlaid by extremely mobile areolar tissue which is drained by both veins and lymph channels These at times become inflamed as the result of trauma in the presence of gonococcal infection of the anterior urethra. The lymph channels drain mainly into the inguinal lymph nodes which in severe gonorrhea, rather commonly become inflamed, causing the so-called gonorrheal bubo a complication occasioning discomfort but devoid of danger

II. NORMAL HISTOLOGY

There have been many very careful histologic studies made of the entire urogenital tract by those well able to differentiate the various types of tissue. As one compares the findings of these investigators regarding the mucous membrane of the male urethra he meets with many differences of opinion as to just what varieties of cells line the different portions of the canal. In such a comparison it early becomes apparent that the differences are *not with the histologists but with the urethrae, that, while in most* individuals certain definite statements can be made in this regard there are also those in whom marked exceptions occur

A knowledge of the types of cells that line the different portions of the urethra is of the greatest importance to one who would understand gonorrhea in the male. From a study of the course of the disease it is much in evidence that most individuals possess urethral mucosae that rather closely follow the description most commonly met with in the textbooks upon the subject. For this reason, a brief description of these will be given first and, as the aberrations from what we will call "normal" are evidently not rare, those then will be pointed out.

In most instances the fossa navicularis for a distance of almost a centimeter is lined with stratified squamous cells Beyond these we find columnar cells as far as the bulbomembranous junction. In most areas there is but a single layer of these cells while in some there are several layers of differing shapes beneath the superficial cells—round cuboidal and caudate The columnar cells likewise, line the many small glandular off-shoots of the canal. In the depths of these canals we find true secretory epithelium.

Beginning at the bulbomembranous junction, and extending throughout the posterior urethra, bladder and ureters is what has been called transitional epithelium though the smaller mucous channels emptying into these structures are lined with columnar or cuboidal cells.

At rest, transitional epithelium is practically a stratified cuboidal epithelium that flattens out into squamous like cells when the cavity it lines becomes fully dilated. As the dilatability of these cavities differs greatly it is apparent that in some areas the cells

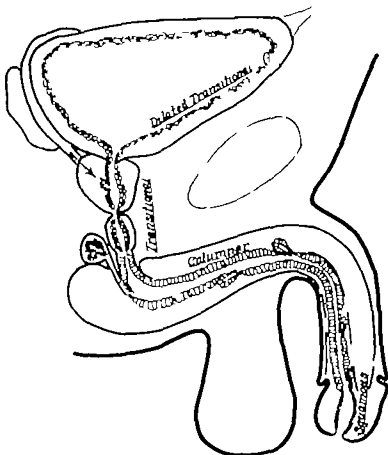


Fig. 14.—Diagram to illustrate the locations of the various types of mucous membrane in the male urogenital tract. All of the channels leading from the main tract are lined by columnar cells.

are never really flattened out, but remain as stratified elements of varying shapes. As these changes seem to have a very definite relation to the susceptibility to gonococcal infections it is well to consider them carefully The membranous urethra, being in the grasp of the compressor urethrae muscle and the posterior

urethra, being surrounded by much muscle tissue as well as the decidedly resistant prostatic substance, their dilatability is definitely limited. It is, therefore, probable that their cells remain as stratified cells of considerable thickness and never flatten out like those of the bladder wall. Likewise, the trigone and the vesical outlet, being rather firmly fixed to the subjacent tissues, do not dilate sufficiently for their cells to become greatly flattened The same could be said of the ureters and kidney pelves

While there are some slight differences in the submucosae of these areas they seem not to be of any great importance in our present study except so far as they favor the dilatability of the different surfaces. The bulbar, membranous and posterior urethrae have marked musculatures that are almost absent anterior to the bulb.

The ejaculatory duct has no circular muscle tissue except near the seminal vesicle while in the vesicle, ampulla and vas deferens the circular muscle fibers are marked. All are lined with columnar cells. In the lower extremity of the vas deferens and the epididymal tube many cells present cilia, which, however are nonmotile.

The general bladder wall is lined with cells which when the viscus is undilated, are exact counterparts of those of the posterior urethra and trigone. As the viscus dilates, however they change so greatly in shape as to become but two layers of flattened or squamous-like cells.

Viewing the foregoing as the normal it is important to realize that there are decided variations from it in some individuals and that these variations may in a measure explain some of the clinical differences in the course of the disease In the chapter on "Influences of Histologic Structure" we shall consider the subject from the standpoint of the varying susceptibilities of the different types of mucosa, but we should have a clear conception of where these types are found.

At times, the fossa navicularis is lined with columnar cells and not with squamous. In some, the expanse of columnar cells extends from the fossa navicularis to the verumontanum. In others the columnar cells disappear at the anterior extremity of the bulbar portion of the anterior urethra and are replaced by transi

tional cells. Again, all histologists have encountered islands of squamous cells throughout the canal and many speak of islands of columnar cells in the posterior urethra.

From this it will be seen that structural differences afford ample reason to expect a number of clinical variations in the course of gonorrheal urethritis in the male that, as different types of cells differ in their ability to withstand infection by the gonococcus, certain urethrae are less protected than others and would be expected to behave differently To some Nature has been kind, while dealing less amicably with others.

III. THE GONOCOCCUS

Like the disease it produces, the gonococcus got a bad etymological start, for the meaning of its name is a berry like organism that causes a flow of semen It is not berry-like and no one would mistake the discharge it produces for semen in these more enlightened days. Morphologically it presents two hemispherical bodies divided by a distinct transverse space and has been likened to the flat side of a coffee bean. Under ordinary conditions it maintains this definite shape both in cultures and in the purulent discharge of the disease Unfortunately it is not the only bacterium that presents the same appearance under the microscope. Not only do its fellow members of the group Neisseriae resemble it but many other cocci during their stage of division resemble it so closely that they cannot be differentiated from it by microscopic study alone This is so of many elements of both the streptococcus and the staphylococcus. Coccoid forms of the colon bacillus often must be studied with extreme care if they safely are to be differentiated from it. The same is true of the pneumococcus.

With the exception of the meningococcus and a few of the rarer forms of the Neisseriae these germs are by no means rare in the urethra. In fact, some of them are to be found in the urethral secretions of a large percentage of individuals both in the presence and absence of irritative symptoms It is because of this frequency of occurrence and the great difficulty in differentiating them from the gonococcus that some differential stain must be used if one would safeguard his diagnosis of gonorrhea. To pronounce a given discharge as one caused by the gonococcus just because he finds diplococci of typical shape is to accuse an unfortunately large number of individuals of having that disease who in reality do not have it Despite this fact, which no one can deny it is not unusual to encounter in the writings of even well-known urologists the statement that staining with methylene blue alone is sufficient for a safe diagnosis.

It has been the writer's privilege on not a few occasions to convert by ocular demonstration some of these urologists. There has drifted down through the years the impression that one was safe in pronouncing as gonococci any diplococci of "typical" morphology that were found in the polymorphonuclear leukocyte That this is far from a safe assumption is to be shown with the utmost ease by a differential stain, the Gram method. With inter esting frequency the staphylococcus in its fission stage is to be seen in the polymorphonuclear leukocyte. Not only is this confusing morphology present in some of the intracellular staphyl ococci, but it not infrequently is so of all those present. The writer always keeps a few such slides in his office as a lesson for those who are so sure of their ability to distinguish the gonococcus when they see it. One spread is stained by the Gram method and another is stained only with the counterstain used in this method The latter is shown first and almost invariably pronounced the gonococcus by the 'authority When the other spread showing that the intracellular diplococci are definitely gram-positive is placed under the lens, the "authority" rapidly gets over his cock sureness. Whether or not he later throws out his bottle of methyl ene blue depends entirely upon the type of individual he happens to be Opportunities have not been wanting to demonstrate that even the most shiftless and easily satisfied of doctors insist upon the performance of a reliable Gram stain when the spreads come from their own urinary canals. What is demanded by frightened doctors should be insisted upon for their frightened patients

The Gram method of staining is based upon the observation that, when bacteria are stained by certain dyes and then subjected to the action of iodine one of two things happens The dye is made alcohol- and acetone-fast *i.e.*, it does not wash out or it is not influenced thus and the color does wash out.

$$\text{Smear} + \text{dye} + \text{iodine} + \text{alcohol or acetone} = \begin{matrix} + \text{ holds dye} \\ - \text{ bleaches} \end{matrix}$$

Thus, gram-positive bacteria hold the original dye and it is washed from those that we call gram negative" and being thus decolorized one must stain them again with a dye of another color to be able to see them under the microscope Aside from these

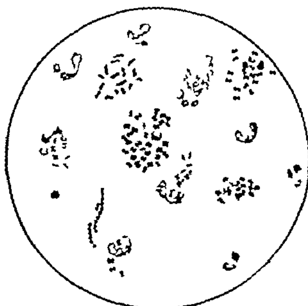


Fig. 15.—Appearance of the more common types of bacteria found in non-gonococcal urethritis. The gram-negative diplococci are much larger than gonococci and resemble the large gram-negative forms of staphylococci seen in twenty-four-hour cultures of staphylococci upon cornstarch agar.

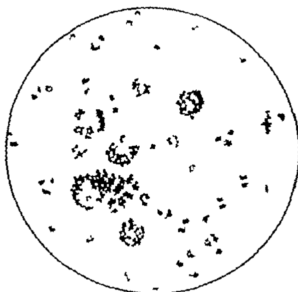


Fig. 16.—Gram stain smear from urethra of an individual who had never had, and at the time did not have gonorrhea. The bacteria present were staphylococci, some of which had not developed gram-positive characteristics and others of which had lost them through partial digestion in leukocytes.

two great groups of bacteria there are some that show what we have called "indifferent staining, in that some of the elements are gram-positive and some are gram negative.

So far as the bacteria that infest or infect the urogenital tract are concerned, one must not assume that the gram-positive group are all invariably gram-positive Indeed it is extremely common to find many gram-negative elements among those that we seldom think of as being anything but gram-positive. This is particularly true of both the staphylococcus and streptococcus, and one frequently sees gram negative elements of both of these cocci that are truly diplococcal in morphology Fortunately for diagnostic purposes, one practically never sees these aberrant forms unassociated with other definitely gram-positive elements He may find an occasional detached diplococcus but, as a rule, they are in clusters of their fellows that cannot be mistaken. This is as true of intracellular as it is of extracellular bacteria. For this reason it is general, and safe custom to disregard gram-negative diplococci that are found in or near clusters of definitely gram-positive ones. In very young cultures of staphylococci most or all of the elements may be gram negative, though they become positive on longer growth Such, unfortunately is not the case in urethral spreads, a fact that makes the above mentioned custom diagnostically safe (Figs. 15 and 16)

Another fact regarding intracellular gram-positive cocci is well worth bearing in mind. Such bacteria are digested by the leukocytase and as they undergo this digestion they lose their alcohol and acetone-fastness so that they take the color of the counterstain. In other words they become gram-negative. This, however they rarely if ever do to a uniform degree Thus one finds in the same cell coccal and diplococcal forms that range through all of the dye intensities from the dark purple of definite gram-positiveness to the palest pink of the almost digested "shadow forms. These multicolored bacteria safely can be assumed not to be gonococci. For while it is not unusual to see bacilli and cocci in the same leukocyte, there is little probably nothing to suggest that the same cell takes up either gonococci and staphylococci or gonococci and streptococci at the same time

Turning to the possibility of definitely gram negative cocci taking on gram-positive characteristics, it can be said that, though several investigators claim to have made gonococci undergo such a change, the weight of bacteriologic evidence is entirely against such a possibility Herrold[1] puts forth the claim that the gonococcus can be made to undergo a change in culture so that, "True altered gonococci vary from the extreme of solidly gram-positive coccal and bacillary forms including pleomorphism, through in termediate types with labile tinctorial characteristics like those of pleomorphic streptococci and diphtheroids, to definite gram nega tive rods and filaments." He further states that, "similar altered types can be seen in smears of gonococci in all stages but in much greater variety and predominance during clinical improvement and when cure is approaching"

Such an observation, if true would put an entirely different face upon what has been said above For years out of mind these gram-positive bacteria have borne the designation of secondary invaders and so far as disease spread is concerned they have been disregarded The writer has paid no attention to them what ever and if Herrold were correct, he should have reaped a veritable harvest of infected wives and sweethearts a thing he most certainly has not done On clinical grounds alone such a view as Herrold's is decidedly untenable Though interesting it safely can be dismissed from the clinical picture of the disease where it only would serve to increase uncertainty as to cure. The same microscopic pictures are to be found in the urethral secretions of countless patients who have never had gonorrhea.

It always has been held that gonococci were not digested by the ferments of the polymorphonuclear leukocytes. Since sulfanilamide has been in use in the treatment of this disease, as elsewhere has been stated there is some reason to believe that such a view may have to be modified in those whose disease is favorably influenced by this drug For close study of these intracellular bacteria strongly suggests that some of them have been changed in the same way that happens with intracellular staphylococci. In the same cell one may see deeply staining diplococcal forms, less deeply staining monococcal forms and even what we

[1] Am J Syph Gonor & Ven Dis 20: 614 1936

have been pleased to call 'shadow forms If this is universally true, it may furnish a clue to the mode by which sulfanilamide produces its commonly favorable results. Heretofore the leukocyte only transported the gonococcus from place to place without harming it, for there could be no doubt about the continued viability of intraleukocytic gonococci. Cultures made from pus wherein practically all of the gonococci were intracellular gave thousands of colonies a thing that most certainly could not have occurred if phagocytosis meant gonococcal death.

Among the many peculiarities of the gonococcus the one of greatest good fortune to the human race is that it dies immediately upon drying. This fortuitous circumstance greatly limits its spread, confining it to those individuals whose susceptible mucous membranes come into contact with fresh gonorrheal discharges. There is further human good fortune in the fact that this bacterium is also killed immediately by soap solutions and other mild bactericides

THE GRAM STAIN

Since the introduction of this method of staining bacteria was devised by Gram there have been suggested many modifications. Most of these have been aimed at overcoming the inconvenience occasioned by the lack of keeping qualities of the aniline gentian violet originally employed. Unless kept in the ice box this stain rapidly deteriorates, and even when so kept it may separate. To overcome this difficulty Weigert suggested the following

Solution A

Gentian violet	2 Gm
Aniline oil	9 cc.
Alcohol (95 per cent)	33 cc

Solution B

Gentian violet	2 Gm.
Distilled water	100 cc

Mix 1 cc. of A with 9 cc. of B and filter These solutions keep indefinitely when separate but, when mixed they are not to be trusted for much longer than two weeks.

Later Stirling's gentian violet solution, made by the addition of 1 part of a saturated alcoholic solution of gentian violet to 10

parts of a 5 per cent solution of carbolic acid, was suggested This combination stands up indefinitely It has, however, a tendency to overstain. Some have substituted crystal violet for the gentian violet.

For years the writer used a 1 per cent solution of methyl violet 6B in distilled water with considerable satisfaction. As an added precaution, it has been suggested that there was considerable value in dropping a few drops of 5 per cent sodium bicarbonate upon this solution while it was acting

It is probable that the most reliable of these initial stains is Hucker's commonly called ammonium oxalate crystal violet, which is made by adding 25 cc. of a saturated alcoholic solution of crystal violet to 100 cc. of an aqueous solution of 1 per cent ammonium oxalate. The tendency of this solution to stain rather deeply is not altogether a misfortune when one is dealing with gram-negative bacteria. This is rather easily overcome by further dilution with water, if one wishes to do so The solution keeps indefinitely

Of perhaps more importance in the carrying out of the Gram stain is an assurance of good and sufficient iodine action. Quoting from Stitt Clough and Clough,[1] 'Sheppe and Constable demonstrated that when exposed to light and heat the iodine solution used in the Gram stain may become acid owing to the formation of small amounts of hydriodic acid, which exercised a discoloring effect on normally gram-positive bacteria. According to Kilduffe sodium bicarbonate will neutralize the acid formed in the iodine solution as well as any that may be in smears made from acid secretions ' Hence Kilduffe advised the following solution

Iodine crystals	1 Gm.
Potassium iodide	2 Gm.
Distilled water	240 cc.

To this solution was to be added 60 cc. of an aqueous 5 per cent solution of sodium bicarbonate.

[1] E. R. Stitt, P W Clough and M C. Clough "Practical Bacteriology Haematology and Animal Parasitology" (9th Ed.) (By permission of P Blakiston's Son and Company Philadelphia, publishers)

As so much of one's microscopic diagnosis depends upon clear-cut staining, none of these observations are too trivial for notice. Few things are more sure than that one can be sadly misled by an improperly done Gram stain or one in which though properly carried out, the materials used are not what they should be. Because of these possibilities it is well to use stains that both keep well and stain well. No mistake would be made in selecting as an initial stain ammonium oxalate crystal violet solution with the feeling that it need not be watched for disintegration. And no matter which iodine solution is chosen, one should bear in mind that the iodine gradually disappears from it, and, as it weakens, it becomes much paler in color It, therefore, should be watched and discarded if it falls much below its former denseness of color

As a decolorizing agent either alcohol or acetone can be used. Acetone seems to decolorize spreads more rapidly, give a clearer field and exercise its bleaching power less on definitely gram positive elements.

For a counterstain, the writer prefers fuchsin because it gives a clearer contrast with the dark purple of the acetone-fast elements. It is more rapid in its action than safranine and is kinder to the eye than the lightly staining Bismarck brown. This solution may be made by adding 1 part of carbolfuchsin (as used for staining the tubercle bacillus) to 10 parts of distilled water Carbolfuchsin solution is made by adding 10 cc. of a saturated alcoholic solution of basic fuchsin to 100 cc. of a 5 per cent aqueous solution of carbolic acid A 0 1 per cent of basic fuchsin in distilled water serves equally well.

It is highly important that fuchsin solutions be properly bottled if they are to be relied upon for good counterstaining in the given dilutions. Placed in bottles of Jena glass they keep for many months. If other glass is used the inside of the bottle should be dried thoroughly have some melted paraffin poured into it and the bottle rotated in such a way that the entire inside is coated before the excess is poured out. In such a bottle it also will hold up for months. Its possibility of change gives value to its occasional inspection for reduction in color and the formation of small flakes denoting its uselessness

The Technic of the Gram Stain—Care should be taken that the preparation to be studied is evenly and thinly spread upon the slide and that it be either dried in air or by extremely gentle heat. It then should be 'fixed' to the glass by a few quick passages over a flame in such a way that it is not burned. No difficulty will be encountered in having substances rich in pus adhere to the slide but urinary sediments, prostatic and seminal fluids require the special preparation outlined later.

When newly made stains are to be used they should be tested upon some known gram-positive material before too much reliance is placed upon them unless one prepares his own stains from dyes known by previous use to be reliable. Indeed, some extremely careful workers urge the placing of a minute spread of definitely gram-positive bacteria on the same slide with the material for study so that a constant check can be made as to the reliability of the staining method. While this rarely is done in routine practice, it would be a simple matter to prepare many slides in advance from a culture of known acetone-fastness as they will retain this quality for many months after being fixed to the slide.

1. A few drops of the ammonium oxalate crystal violet are placed on the preparation and allowed to remain for about two minutes. This may be shortened if the slide is heated until the stain begins to steam. (Stirling's gentian violet stains more rapidly.)

2. Wash the excess stain off with distilled water.

3. Apply the iodine solution and allow it to remain until the preparation turns brown. It is a good plan to pour off the first iodine solution in a moment and apply some more.

4. *Pour off the iodine and wash with acetone until no more purple comes away.*

5. Wash with distilled water.

6. Apply the fuchsin stain for about twenty seconds.

7. Wash with water and dry.

Stained in this way all of the gram-positive elements are of a deep purple color and the gram negative ones are a brilliant red. Though usually red the nuclei of pus cells not uncommonly retain some of the purple dye.

THE GONOCOCCUS AND HEAT

For many years investigators have toyed with the idea of curing gonorrhea by the raising of body temperature largely be cause it had been noted by many that gonorrheal discharge com monly reduced in volume or completely disappeared during prolonged high fevers. The fact that they just as commonly returned shortly after the fever dropped to normal, or near it, did not in any sense erase the idea that fever had a curative influence upon this disease As early as 1864 Hellendahl used injections of turpentine beneath the skin to cause elevation of body tempera ture and was of the opinion that it had great merit when it did produce fever Throughout succeeding years his experiments have been repeated by many and even as late as 1928 Nittis again

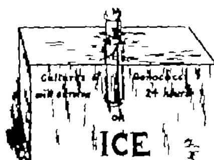


Fig 17

voiced the same conclusions as were reached by Hellendahl sixty four years before. Many other methods have been employed for the elevation of the temperature of those suffering from gonorrhea and most of them terminated in the conviction that there was value in the procedure but that it was not in itself curative often enough to justify its general use.

As was natural these observations raised the question as to just how much heat was required to kill the gonococcus in vitro. Many bacteriologists and near-bacteriologists turned their atten tion to the matter with the result that hardly two of them agreed fully upon the answer Some said the gonococcus was killed quickly at 104 F and others said 108 F was required. The theory of the treatment of gonorrhea by local diathermy originally

was based upon this latter figure Its rather general failure to bring about cure showed that there either was some mistake about the gonococcus being unable to survive that temperature in vitro or that local temperatures were not raised that high by such methods. In 1927 Schofield demonstrated that subcultures from laboratory strains, when placed for one-half hour in a water bath, usually survived temperatures lower than 113 F and that new cultures from fresh pus survived temperatures below 111 F

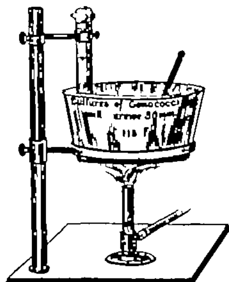


Fig. 18

As no such temperature elevations were compatible with human life such a finding naturally turned the attention of those interested in the problem toward the determination of the length of time this bacterium could survive at temperatures compatible with human existence. Again there appeared many highly conflicting answers, and it was not until the work of Carpenter Boak Mucci and Warren (1933) that the questions involved were settled with any great degree of scientific accuracy Kendall Webb and Simpson repeated the work of these investigators and obtained essentially identical results " It, thus is apparent that reliance can be placed in their results and that they can serve as

an absolutely trustworthy foundation for thermotherapy against this disease. These findings were briefly as follows

"102 F There was very little effect upon gonococci in vitro.

"104 F At this temperature 99 7 per cent of the gonococci were dead at the end of ten hours, but *50 per cent of the cultures were not sterile at the end of thirty hours*

105.8 F Here 99 per cent of the organisms were killed in four to five hours, but *some required from eleven to twenty-three hours*

'106.7 F All cultures were sterile in from five to fifteen hours. (Using the same technic again Boak, Carpenter and Warren upon 130 stains of gonococci restated this figure as being from *six to twenty-seven hours*)

Primarily, the treatment of gonorrhea by the prolonged elevation of body temperature rests upon the direct killing of gonococci by the heat. Secondarily as the result of the behavior of some few patients after heat treatments at temperatures around 105 to 106 F for far shorter periods than the immediately preceding findings would indicate necessary the theory is being put forth that there is a prolonged effect after the treatments that has to do with the stimulation of the body's defensive mechanism. This possible effect is not only theoretical but it is highly uncertain, seemingly applying only to some few patients. It, however has furnished encouragement to many workers either not equipped to or too timid to raise body temperature to 106 7 F and keep it there for the full thermal death time of the particular strain of gonococci causing the given infection One cannot help admiring such timidity or concern for patient welfare in the carrying out of so dangerous a procedure, though he may question the real value of some of the efforts. One investigator who had had much experience with prolonged hyperthermia voiced his opinion of it in the following words to the writer 'Prolonged temperatures of 105 F for from five to six hours do not cure gonorrhea and when you go above that you are decidedly in dangerous territory Maybe you could stand one death in a hundred but it would ruin me." One finds much food for thought in such an opinion and also much that raises a question regarding many of the reported cures from the lower temperatures.

GONOCOCCUS CULTURE AND DIFFERENTIATION

Though it has been possible for a number of years to isolate the gonococcus from mixed cultures and to prove beyond doubt that the organism obtained really was the gonococcus, it has been a task to which the bacteriologists have in no sense flocked Most of those who were not attracted by the problem or were not in a position where they were compelled to work upon it still held to the old idea that this was one of the most difficult of bacteria to grow and that there was little use in trying to isolate it from mixed cultures when few would credit the findings anyway As the result of this feeling that largely was justified by general conditions until within the last five years many bacteriologists held to the old prejudices and according to Carpenter's later cited survey, they still do

It is obvious that the call for these studies which now have become a matter of vast social importance must come from those who treat gonorrhea The laboratories that voluntarily will fit themselves to meet such a demand probably are very few In extenuation of this attitude it is only fair to them that there be in the minds of those who ask for such studies a full realization of the size of the task for the bacteriologist. The matter of isolating the gonococcus and proving it such is not the decidedly simple one of showing that a given bacterium belongs to such groups as the staphylococcus, streptococcus or colon bacillus Nor are the culture media so easily made and kept as are most of those required from the group identification or type determination of most other common pathogenic bacteria Some of these media are difficult to make and to obtain the best results many of them must be freshly made Where calls are few one readily can see that such media often must be made after the specimen is received a misfortune that only can be obviated by calls in such numbers as to warrant the frequent making of such media.

Beyond the question of media for initial growth loom those of proper medium for differential fermentative studies and the preparation of fresh dimethyl-para-phenylenediamine hydrochloride solutions for the rather generally used oxidase reaction And even beyond these is the need for a technical skill and experience that is gained only by the frequent doing of the same

thing. It is the feeling of many, notably Zinsser, that flocculation, precipitation and agglutination tests have not reached a stage of great practicability though some careful bacteriologists use them

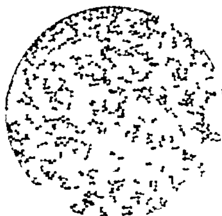


Fig. 19.—The gonococcus from culture during the period of viability (David Thomson.)

From such an array of things it easily can be seen that the positive identification of the gonococcus in mixed cultures requires



Fig. 20.—Gonococcus from culture during autolytic stage. (David Thomson.)

much material and even a larger amount of skill and knowledge. It is a task far beyond the casual bacteriologist and the physician and it will remain so until far simpler means of identification are

developed. As has been shown, the real task is not that of grow ing the gonococcus in pure cultures but in isolating it from mixed ones and then proving that it is the gonococcus. Unfortunately

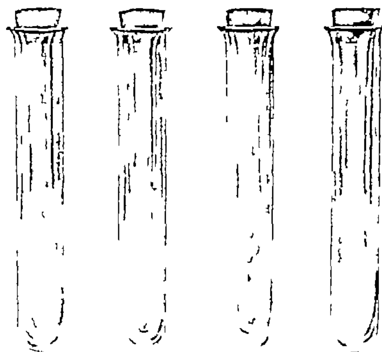


Fig. 21

there has been developed no medium upon which the gonococcus alone grows nor is it likely that there will be There are a number of media however upon which it will grow with varying degrees of luxuriance if they are moist, of the proper hydrogen-ion con-

centration (pH 7.2–pH 7 6), and incubated for a sufficient period at the most favorable temperature (34 –37° C.)

Regarding the need for air or 10 per cent carbon dioxide as the better environment for growth there long has been a difference of opinion among many of those who have cultured this bacterium Some claimed better results from normal oxygen tension, while others were just as insistent that a reduction in oxygen tension gave far more growths and more luxuriant ones One can see a suggestion that much of this difference of opinion belonged to the temperature at which the cultures were incubated in the following table by Leahy and Carpenter [1] Also he can see that there are better general results obtained under conditions of reduced oxygen tension.

RESULTS OF GASEOUS ENVIRONMENT AND TEMPERATURE ON THE ISOLATION OF 64 STRAINS OF THE GONOCOCCUS

	Gaseous Environment for Isolation	
Growths obtained at	Number of air strains	Number of 10 per cent CO_2 strains
34 C.	15 or 71 per cent	4 or 9 per cent
37° C.	2 or 10	6 or 14
34 and 37° C.	4 or 19	33 or 77 "
Total number of strains 64	21	43

Of the media most appropriate for growing the gonococcus Stitt, Clough and Clough [2] name the following Schwartz's medium, Pelouze and Viteri's calf-brain agar 'chocolate" agar Cracke s medium (for blood cultures) and blood-streaked agar While the gonococcus will grow well on all of these when they are properly made and kept moist, by far the large majority of workers now use the so-called chocolate" agar Leahy and Carpenter have made a modification of this which, in their opinion gives even more reliable cultural results

Recently the Difco Laboratories have made a special dehydrated combination medium for gonococcal culture that should remove much of the drudgery for those who make cultures The writer has had no opportunity for trying this out as yet. Inquiry of Dr Charles M Carpenter who has used much of it, elicited

[1] Am. J Syph Gonor & Ven. Dis. 20: 355, 1936.

[2] Practice of Bacteriology etc P Blakiston's Son & Co Inc Philadelphia, 9th ed., 1938.

the following reply "I have no hesitancy in recommending the medium which the Difco Laboratories are preparing for the isolation of the gonococcus Comparative tests have been made in Detroit, in the New York City Department of Health, and here, and it is a better medium than we can make in our own laboratories. Furthermore, it is very convenient for the small laboratory that does not have the equipment for making special media."

From so fine a recommendation by one who has carried out such extensive work in gonococcus culture and differentiation, it is apparent that this medium marks a great advance in many

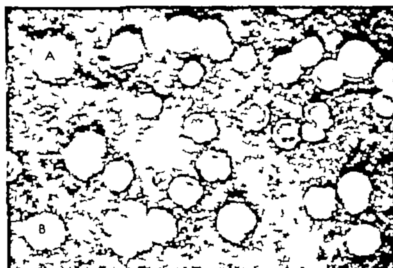


Fig. 22—Mixed culture of Micrococcus catarrhalis (A) and gonococcus (B) on chocolate" agar (Kindness of Dr Charles M. Carpenter)

ways It is known as Bacto-Proteose No 3 Agar and Bacto-Hemoglobin and as complete directions for its preparation and use come with each lot, there is little point in detailing them here.

In 1928 Gordon and McLeod[1] reported upon a study of the production of oxidase in the growth of the gonococcus and suggested the pouring over plate cultures of a 1 per cent aqueous solution of dimethyl-para-phenylenediamine hydrochloride to demonstrate its presence This procedure more commonly spoken of as the oxidase reaction turns oxidase-producing colonies

[1] J Path & Bact. 31 185 1928.

pink, and on further oxidation they deepen to a maroon and, finally to black. Though a positive reaction does not signify that a given colony is gonococcal it does suggest that it is likely to be one of the Neisseriae If after the application to the plate of the above solution, such colonies are removed by a platinum loop before they become of too deep a color and quickly spread upon proper medium they almost invariably grow Such, however is

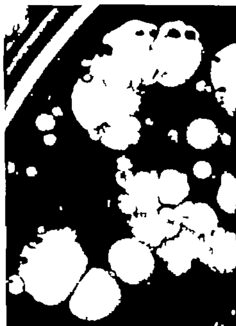


Fig 23.—Mixed culture from the uterine cervix on "chocolate" agar Black spots are areas of gonococcal growth that have been subjected to the oxidase test. (Kindness of Dr Charles M Carpenter J Syph., Gonor & Ven. Dis. 20: 158, 1936.)

not the case if sufficient time has elapsed for oxidation to proceed until the colony becomes black. Close inspection of Figs 23 and 24 will show the striking visual changes produced by this reaction. It is the opinion of most advanced workers on the subject that the selection of colonies for further identification by this method is far simpler and more trustworthy than is their selection from visual growth characteristics alone.

After selection of the colony from the plate fermentation tests

usually are resorted to It has been demonstrated that the gonococcus produces acid when grown on media containing dextrose but not on those containing maltose, the meningococcus produces acid on both the staphylococcus on both while the Micro-

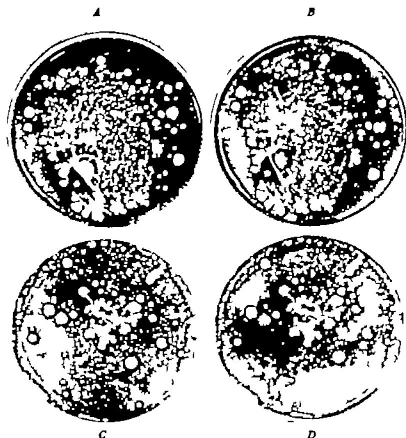


Fig 24.—Appearance of plate cultures before and after the oxidase test. *A* Before reaction *B* After reaction. Close inspection will show a number of small black spots denoting completely oxidized gonococcal colonies. This change is even more clearly seen by a comparison of *C* and *D*

coccus catarrhalis does not produce it on either To demonstrate this acid production visually phenol red is added to the medium as it is made.

Thomson s alkali solubility test, carried out by shaking suspensions of pure cultures of the suspected bacteria in a N/20

solution of sodium hydroxide, is based upon the varying degrees of immediate autolysis shown by the several bacteria most commonly offering confusion. Suspensions of the confusing bacteria

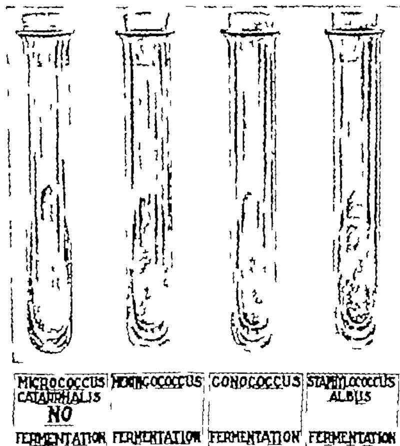


Fig. 15.

are poured in test tubes containing the reagent and the result immediately is determined by the clearness or opacity of the resultant mixtures. Though of considerable value it is in no sense

so accurate as are carefully carried out fermentation reactions. The gonophage identification test also may be employed

ACTION OF STAPHYLOCOCCUS AND NEISSERIAE ON MALTOSE BRAIN ACAR

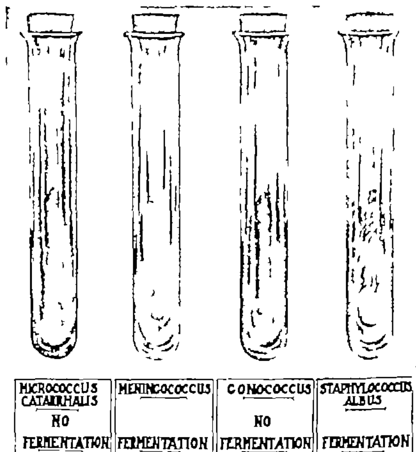


Fig 26

THOMSON'S ALKALI SOLUBILITY TEST
MAKE A SUSPENSION OF SUSPECTED BACTERIA IN ½% SODIUM HYDROXIDE AND SHAKE

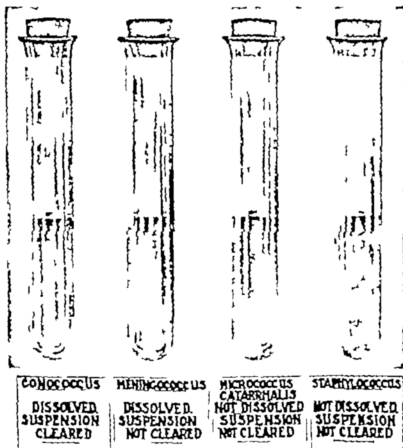
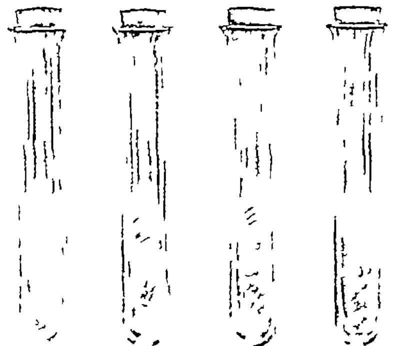


Fig. 27

GONOPHAGE IDENTIFICATION TEST FOR GONOCOCCUS

PELOUZE & SCHOFIELD - JOURNAL OF UROLOGY APR. 1927

SUSPENSION OF BACTERIA + GONOCOCCAL BACTERIOPHAGE
4-24 HOURS EXPOSURE - CULTURE AND INCUBATION



GONOCOCCUS	MENINGOCOCCUS	MICROCOCCUS CATARRHALIS	STAPHYLOCOCCUS
LYSIS NO GROWTH OBTAINABLE	NO EFFECT GOOD GROWTH OBTAINED	NO EFFECT GOOD GROWTH OBTAINED	NO EFFECT GOOD GROWTH OBTAINED

Fig. 21.

IV THE PATHOLOGY OF GONORRHEA

THE old descriptions of the surface pathology of gonorrhea and to which we still cling painted for us pictures of epithelial desquamation in the early stages. In the later stages they described layer upon layer of squamous-like cells the superficial ones of which even went on to virtual keratinization in the late reparative stages. To one who has followed closely the urethral discharges of gonorrhea with the microscope it becomes perfectly obvious that these older studies must have been made upon patients who had received much urethral treatment. If epithelial cells shed they appear in the urethral discharge and certainly there are not enough of them in discharges from gently treated patients during the early stages to support even the suspicion of the surface denudations that were described. If on the other hand strong chemicals are injected into the canal, large quantities of epithelial cells appear, often enough to make one suspect such breaks in surface continuity

NOR can one find in the later stages of the disease in gently treated patients microscopic pictures that in any way would suggest that such a reparative stage belonged to gonorrhea itself It is the habit of Nature that, when she starts such epithelializa tion she overdoes the work by building up so many layers that the superficial ones are cast off There is no stage of gonorrhea in patients in whom the urethra has not had to protect itself from either chemical or instrumental trauma, wherein epithelial cells appear in the urethral discharge in numbers as they most cer tainly would under such a reparative process. Indeed the moment one sees these cells beginning to appear in quantities he is forced to conclude that the treatment he is using is injurious to the particular urethral mucous membrane to which it is being applied And, if he is wise, and wishes to discharge a patient whose urine is free from shreds he immediately uses a milder form of treatment

Thus, while we may accept the pathologic descriptions of Finger Ghon and Schlagenhaufer as being correct, we must raise

a question regarding those others wherein early desquamation is described. And we must view those descriptions of the later stages of the disease as descriptions of things due to treatment efforts and not truly the reactions caused by the gonococcus and its toxin. Perhaps nowhere can one find a more concise summarization of the pathology of early gonorrhea as outlined by the earlier German workers than is that of Keyes.[1] The studies upon which these findings were predicted it will be recalled, were made on prisoners before execution. Keyes description is as follows Thirty-eight hours after inoculation, the gonococci had only just begun to effect an entrance between the epithelial cells.

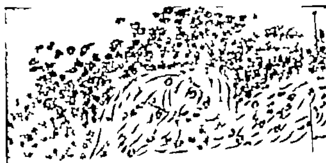


Fig 29.—Copy f Finger's original illustration of the microscopic pathology of gonorrheal urethritis. The penetration of gonococci into the submucosa, as well as their extracellular location, is well shown (*b*) In the epithelial interspaces there is much phagocytosis ( )

The lacunae of Morgagni were crowded with gonococci dia pedesis had begun and intracellular gonococci were found among the few leukocytes on the surface At the end of three days the inflammatory process was well under way The surface of the mucous membrane was covered with pus its epithelium infiltrated by bacteria from one side and by leukocytes from the other The inflammation showed four striking characteristics, viz.

1 The pavement epithelium of the fossa navicularis, although swollen with leukocytes, resisted the invasion of the gonococci almost absolutely

[1] Cabot's Urology 3rd Ed 1936, Vol I p 270 Lea and Febiger Philadelphia, publishers.

"2 The cylindrical epithelium of the penile urethra was generally invaded.

"3 The invasion was most marked about the crypts and glands, which were packed with pus and gonococci.

"4 The subepithelial connective tissue, though showing evidence of inflammation, contained few gonococci except in the neighborhood of crypts and glands."

There have appeared in the writings of many the statement that large quantities of round cells found their way into the tissues along with the leukocytes Other careful workers have found

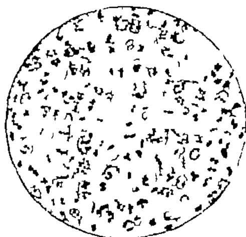


Fig. 30—Copy f Finger's original illustration, showing a higher magnification of the mucous membrane from his foregoing illustration. In it can be seen more plainly the degree of phagocytic action present distal to the basement membrane.

but a small number of the former stressing the fact that large numbers of polymorphonuclear leukocytes were present in the subepithelial tissues and the epithelial interspaces That the latter is nearer the true state of affairs in the pathology of untraumatized gonorrhea seems to admit of little argument. The inherent tendency of accumulations of round cells is to form fibrous tissue and in the urethral wall, fibrous tissue contracts and forms stricture bands. In the absence of follicular abscesses and local trauma gonorrhea does not cause strictures. Practically all postgonorrheal strictures occur as the result of urethral trauma

during the stay of the gonococcus in that canal or follow large or small follicular abscesses.

In the deeper tissues there is hardly any evidence of phagocytosis the gonococci and the leukocytes lying side by side In the epithelial interspaces many of the gonococci have been enveloped by leukocytes while in the urethral lumen phagocytosis is the rule.



Fig. 31.—Drawing from a histologic section of an acute gonorrheal urethra. It has been shown that the gonococci penetrated far below the basement membrane and that wherever there were gonococci in the deeper tissues there were polymorphonuclear leukocytes, so that the presence of one indicated the presence of the other. Such being the case it is interesting to note to what great depths gonococci penetrate. One cannot study such a section closely and find much to support the idea that our urethral injections of bactericides cure gonorrhea because of their direct bactericidal action.

dance, the introduction of sulfanilamide into the gonorrhea would seem to render obsolete our former ing the defensive processes at play in the cure of The more closely one studies the problem the more convinced that such is not of necessity the case. e older ideas apply with equal force in that large viduals whom we classify as sulfanilamide failures. excellent reason to believe that they apply just as in those individuals who are cured quickly by this studies however may prove this to be in error but is no valid reason why we should throw aside all of arding the tissue reactive processes

ainly we can discard the thought that, because sul- utions have *some bacteriostatic and even bacteri* n vitro this drug gains its value from the fact that nilamide in the urine. Urine does not get into the cles and yet, the infection in this gland responds tly as does that in the urethra in patients favor d by the drug Vest, Hill, Harrill and Pitts have erimental evidence to support this view in their from which the following paragraph is quoted.[1]

particularly interested in the question of whether exercised its action upon the gonococci through rough the tissue fluids With this in mind we have following manner 4 patients having acute gonor is They were dehydrated the day before treat holding fluids so that it would be possible for them or a considerable period of time after beginning They were given 0.08 Gm. per kilogram of sul e o clock in the morning just after voiding. Two ts did not void a drop of urine until that night ked changes had taken place in the character of

1 710, 1938

the urethral smears and scrapings and after the gonococci had entirely disappeared The other two were catheterized several times so that voiding was deferred for almost twenty four hours. The catheter was irrigated with sterile water before removing it, following which the urethra was irrigated with sterile water, so that no urine containing sulfanilamide would come into contact with the urethral mucosa. Though no harm resulted from catheterization of these patients it should be made clear that this was purely an experimental procedure to throw light on the changes in the smears while the urethral mucosa was unexposed to the presence of sulfanilamide in the urine."

Thus we must go where we always have had to go for our explanations of the mechanism of cure, beneath the mucous surface in both the sulfanilamide successes and failures And as we go there we find ourselves confronted with the same old need for caution lest we magnify the things that fascinate and reduce to diminishing proportions those that seem lacking in what the newspaper fraternity calls "news value. For theories are but the dreams of our waking moments and frequently they differ from those of sleep solely because they seem more plausible and are aimed better Often they serve as an ethereal foundation for a structure of working knowledge.

Safely we may assume that the mechanisms at play in the recovery from bacterial diseases are of many different natures. Among these may be cited such things as the neutralization of bacterial toxins, bacteriostasis bacteriolysis phagocytosis with and without intracellular digestion and the flushing out of bacteria by tissue fluids. There also might be added the influencing agents to such action that attractive-sounding group of dream warriors that carry the tools of battle antigens aggressins, agglutinins precipitins and perhaps above all for our present purpose opsonins.

One could theorize endlessly upon which of these play major parts in recovery and lack of recovery from this disease And when he was through, he would find that he had only fogged the issue. *So far as the action of sulfanilamide is concerned he might* be tempted to say that when the tissue concentration of this drug reaches a certain point the gonococci are directly killed thereby

And, then, when he reviewed the work of Van Slyke Thayer and Mahoney he would find that it would be necessary to conclude that there were patients who despite high blood concentrations of this drug failed to have high tissue concentrations For they had successes among those with very low blood concentrations and dismal failures in some of those with extremely high blood concentrations. Of a certainty, he would be compelled to discard so simple an answer and fall back upon the need for some immunologic factor that sulfanilamide stimulates in some individuals and does not in others. He could begin by dismissing any flushing out value from exuding tissue fluids, for in the sulfanilamide success this exudation is stopped almost immediately and could play no active part in the cure. With seeming satisfaction he might turn to bacteriostasis and bacteriolysis but he soon would find himself lost in a sea of dreams for these processes so easily demonstrated in the test tube or under the microscope, would defy his efforts to prove their presence in the tissue depths

One could toy with the question of phagocytosis in the sulfanilamide successes with far more satisfaction and immeasurably more chance to prove his contentions right or wrong It is here that the writer seems to find his most attractive theories regarding the action of this drug and in order to tempt some one to prove him wrong, he is going to build his house of dream-cards All that is needed to wreck the house is for some one, by a careful microscopic study of pieces of tissue snatched daily from the urethrae of several patients progressing favorably under sulfanilamide administration, to show that deep-tissue phagocytosis is not in any way stimulated

As was cited in the previous edition of this book it was shown years ago by many investigators that gonococci rarely underwent phagocytosis in the tissue depths that it was common in the epithelial interspaces and the rule on the tissue surface. It also has been common and almost accurate knowledge that the cytase of the polymorphonuclear leukocyte, which was the only cell proved to envelop this microorganism did not digest it that it retained its viability despite phagocytosis The same is true of the tubercle and lepra bacilli and all of the Neisseriae

Carrying the first of these two observations further it is safe

to say that whatever there is of an opsonic factor it ordinarily plays little, if any part in the eradication of those bacteria beneath the epithelial layer They must be dealt with by either the bacteriostatic or bactericidal action of tissue fluids. We know from countless studies of bacteria that certain things stimulate phagocytosis and others retard it. And it is entirely possible that the presence of sulfanilamide in the tissue fluids may bring about the development of changes in these fluids that in some cases overcome the natural aggressions of gonococci and prepare them for envelopment by the leukocytes In other words, there is supplied that opsonic factor needed for bacterial phagocytosis

If for purpose of an argument, one assumes this to be the case he *however finds himself faced with another interesting* problem, viz. What becomes of the phagocytized gonococci? Obviously in the favorable cases, the stream of tissue fluids ceases to flow into the urethra and, with them the escape of leukocytes in numbers ceases. Such phenomena only could mean that either the gonococcal toxins to which inflammatory symptoms are due, have been neutralized by tissue fluids, the gonococci are inside of the leukocytes from which their toxins do not escape or that all of the deeper lying gonococci have been killed. That the last is not the case is suggested by the dramatic suddenness with which the symptoms disappear in the most favorable cases For dead bacteria liberate their highly irritating endotoxins and we should expect a temporary increase of symptoms unless there also was at play a toxin-neutralizing effect. If however there were to be brought about a change in the natural resistive conditions enjoyed by this germ that made its intracellular digestion a possibility, the tissues, thereby would be relieved of both the gonococci and their toxins. For such rapid phagocytosis would check bacterial multiplication at so early a stage as to reduce greatly the amount of gonococcal toxin upon which the symptoms depend.

Many months prior to this writing the author became convinced from his studies of urethral smears from those who were influenced favorably by sulfanilamide that there was evidence to suggest gonococcal digestion within the leukocytes Later comparison of these slides with others from patients who had had no sulfanilamide has not served to shake this conviction In spreads

from the aforementioned groups it was possible to demonstrate differences in the morphology of intracellular gonococci ranging from clear-cut diplococcal forms to large and small monococcal ones and to note staining variations ranging from the deeply staining qualities of uninfluenced gonococci on through the many gradations between these and real "shadow forms" in which staining was so faint as to make them almost invisible. Dr R. W Jones has illustrated a similar change in his recent article.[1]

Be all of this as it may in the patients favorably influenced by sulfanilamide there still remains a large percentage of patients in whom the cure of gonorrhea is dependent upon the natural immunity efforts upon which we had to depend before we were electrified by those decidedly extravagant claims in the press of the world. Assuredly nothing has happened that warrants the discarding of that fund of knowledge that we spent so many centuries in acquiring. We still have need for an understanding of the varied influences of physiology, drainage, patient conduct and other things upon the course of the disease that are discussed in other sections. We should not disregard the tissue responses to gonococcal toxin liberation And we can make good use of what immunologic interpretations our clinical observations of the past can support.

Regarding the action of toxins on the mucous membrane and on the course of the disease we would do well to remember the following important points

1 Gonorrhea is a purulent infection characterized by the liberation of bacterial toxins into the tissue interspaces and upon the free mucosal surfaces.

2 This outpouring of toxins is highly irritating to the mucous membranes.

3 These membranes continue to be sensitive to the toxins for indefinite lengths of time.

4 Even the injecting into the urethra of filtrates of gonococcal products will cause a profuse purulent discharge, usually within eight hours.

5 The same reaction occurs with every emptying of the products of glandular or other infected pockets into the urethra.

[1] Am. J Syph Gonor & Ven Dis 22: 348, 1938.

6 Such recrudescences of discharge usually reduce markedly or subside within forty-eight hours whether treated or not.

7 Occasionally they continue for days or weeks.

8 One or two such toxin responses rarely retard cure greatly

9 Repeated toxin responses greatly delay cure and engender prolonged purulent discharges even from freely draining surfaces

10 The same is true of repeated physiologic insults

Regarding the questions of immunity and curative reactions, the years also have made it possible for us to lay down a number of near-rules that serve us well in our understanding of many of the clinical and epidemiologic phases of the disease Some of these might be enumerated as follows

1 There apparently is no fixed immunity to this disease exhibited by the susceptible portions of the urogenital tract.

2 Curative processes are developed solely against the particular gonococci concerned in a given infection

3 So fixed is this that it rarely is possible to superinfect the individual by the introduction into his urethra during a quiescent period of cultures of his own gonococci.

4 Such a refractory state does not apply to gonococci from another source as superinfection repeatedly may be brought about from them

5 Each superinfection carries an incubation period of three days or more

6 If the patient transmits the disease to another, the change brought about by the growth of his gonococci in the new mucous membranes may be such that he can become superinfected if he later exposes himself to this new infection.

7 If there are repeated transferences of the same "strain" of the gonococci as between husband and wife both parties become gonococcus carriers and show only occasional and fleeting symptoms

8 If either exposes a third party the disease shows no such mildness of course in the newly infected one.

9 There is little reason to believe that there is much difference in virulence between gonococci from different sources. Virulence largely seems to be a matter of the mucous membrane upon which the gonococcus finds itself

10 Almost all of those infections of a type we have been pleased to call "virulent" occur in individuals who have had much alcohol sex excitement, or both, during the period of incubation

11 Women infected by men improving under or made carriers by sulfanilamide medication usually become absolutely symptomless gonococcus carriers from the start. (Later study may show the same in the male.)

12 Males infected by such females have florid gonorrhea.

13 Despite the rather general belief to the contrary gonorrhea does not lie dormant in males for years without producing symptoms Close investigation practically always will reveal that the seeming exceptions to this rule are in individuals who more plausibly prevaricate and stick to the story

14 The sulfanilamide gonococcus carrier may remain symptom-free for some months

15 During this carrier stage in such patients alcohol, sexual intercourse and other things often fail to produce evidences of disease.

16 The nonsulfanilamide marital carrier does have symptoms from time to time which he disregards.

In addition to the above there are a number of things that have to do with what we here have called the "tissue curative responses" that help us greatly in our understanding of the many clinical occurrences that otherwise, are so highly confusing. While we may lack actual proof as to the real mode of action of these phenomena, the years have given us many observations which though we may have applied to many of them words that were high-sounding cloaks of ignorance, are nevertheless the foundation stones upon which our effort must rely Here, again we can resort to near rules to shorten discussion and until we know more about the curative processes at play in the sulfanilamide successes we might even forget that drug for a while

1 Practically all individuals have in them the power eventually to overcome mucosal infections by the gonococcus.

2 The readiness with which these curative efforts are engendered differs widely in different individuals.

3 They are of a particularly tardy nature in female children.

4 They are of such a limited nature that they are only active against the particular "strain" causing the infection.

5 They are the most delicately balanced of any disease and they can be delayed or checked by many things.

6 They seemingly are developed in the infected areas and not in the system at large, and cure in one region does not of necessity promote cure in another, unless it be by the removal of a feeding focus

7 There is little to suggest the action of systemic antibody formation, which seemingly is more of the nature of an overflow phenomenon.

8 These curative responses commonly are augmented by epididymitis and usually are delayed by the graver systemic complications *such as arthritis and gonococcemia.*

9 In this latter characteristic they accord with our experiences in the use of vaccines in other diseases in that overwhelming quantities of antigens check curative response

10 These responses once having started develop progressively and increasingly until cure has taken place unless checked by some one or more of the retarding influences mentioned later

11 Diet, other than alcohol has no influence upon them

12 Involuntary seminal emissions have no retarding influence unless the seminal vesicles are infected.

VI. THE INFLUENCES OF HISTOLOGIC STRUCTURE

One of the most striking characteristics of gonococcal infections is the predilection shown by the infecting organism for certain types of tissue. Just why this is no one knows but there is ample proof that certain histologic structures are completely immune to gonococcal penetration, others less so and others are so highly susceptible as to merit consideration as the one ideal and natural habitat of this bacterium. Not only are there marked differences in surface vulnerability but there is an equally striking difference in the ability of these regions to overcome the infection once it has taken place.

If one studies closely the pathologic histology of gonorrhea of the male urogenital tract, superimposes upon it that of the normal histology and interprets both in the light of common clinical knowledge, he will gain much that aids him in his understanding of the disease location spread and curative effort. If to this he adds a visualization of the influences of anatomic arrangement upon the course of the disease, much that seems highly mystifying will be understood with clearness. He will find that such a study makes it possible to lay down some valuable rules regarding the behavior of certain types of tissue toward this infection rules that will serve him well in all of his contacts with the disease. These rules may be stated briefly as follows

1 Surfaces covered by squamous epithelial cells are practically immune to gonococcal penetration. They may be irritated by the discharges from adjacent structures but they are not, in themselves, gonorrheal.

2 Surfaces exhibiting columnar cells having no cuticular layer and those in the urogenital tract have none are readily penetrated by the gonococcus and show a poorer order of immunity response than does any other type of tissue

3 Surfaces covered by transitional cells show important differences in susceptibility and in curative response as follows (a) Those expanses that do not stretch but are in intimate contact

with their subjacent structures are highly susceptible to gonococcal penetration and show a curative response far better than



Fig. 32.—Squamous epithelium. This type of mucous membrane usually lines the fossa navicularis and, rarely the membranous urethra. Owing to the inability of the gonococcus to penetrate between the superficial layers of cells it is practically immune to gonococcal infection.

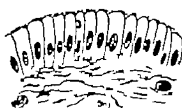


Fig. 33.—Columnar epithelium This type of mucous membrane or modifications of it line the penile and bulbar urethra and all of the smaller mucous channels emptying into any portion of the urethra. The gonococcus easily finds its way through its intercellular spaces into its submucosa It is the most susceptible type of membrane.

that of columnar surfaces. (*b*) Those expanses lining organs that stretch or are only loosely attached to their subjacent structures are practically immune to gonococcal penetration unless their

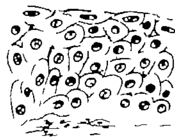


Fig. 34



Fig. 35

Figs. 34 35.—Transitional epithelium This type of cell lines the entire major tract above the membranous urethra It exhibits varying degrees of susceptibility in different regions. In the kidney pelves and ureters it appears to have much native resistance In the bladder where it dilates until it becomes almost squamous in type, as in Fig. 35 it is practically immune unless changed by urinary retention or trauma.

surfaces have been subjected to constant irritation. Such surfaces recover with striking promptness when the irritating influence ceases to exist

Interpreting these rules into clinical values we find that, so far as gonococcal penetration is concerned, we may disregard those regions lined by squamous cells. While this is not of great importance in the male, it is exceedingly so in gonorrhea of the adult female. Before puberty the introitus and vagina are lined by transitional cells and the surfaces do not enjoy such freedom from infection. In fact, they are exceedingly vulnerable to it and they show a very low grade of curative response.

Returning to the male we find an anterior urethra, except in its distal centimeter, lined with the most susceptible type of epi thelium—columnar Also we observe some type of columnar cells lining all of the smaller mucous channels that empty into any portion of the canal. We find in these expanses a low order of immunity response which is commonly interfered with by those things known to put such curative efforts in abeyance or to retard them greatly

In the posterior urethra we encounter an expanse of tran sitional epithelium closely attached to the underlying structures. Such tissues, though highly vulnerable to gonococcal infection ordinarily show good curative response. But here we find native curative power greatly retarded by the action of infective feeders in the prostate. In other words the influence of anatomic struc ture enters the picture.

The trigone similar in structure to the mucosa of the posterior urethra, shows an equal grade of vulnerability to infection but, lacking the retarding influences of bacterial feeders, it usually recovers from infection within a short time.

The mucous membranes of the general bladder wall the ureters and kidney pelves are practically immune to gonococcal infection unless their surfaces are changed by the influences of trauma or the irritation of fermenting retained urine

Taken in its entirety we observe a mucous tract which from without inward displays varied degrees of susceptibility and native curative responses to an organism that passes in that direction. At the beginning of its journey it must travel over an expanse of inhospitable mucous membrane the squamous-lined fossa navicularis. Almost, it would seem as if an all-wise Provi dence in anticipation of the entrance of thorns into the garden

of love had tried to protect. Like much of Nature s architecture, however, this effort fell short of its purpose, for, in some unex plained way this nonmotile bacterium is able to journey to its most ideal habitat, the columnar lined expanses in and com municating with the anterior urethra. In its onward journey to the higher reaches of the tract it encounters a none too efficient barrier to its progress, the cut-off muscle which it finds in tonic contraction. Here the architect showed a slight degree of partial ity to some while he failed dismally with the vast majority He gave to a few a squamous-lined membranous urethra, while to others he presented a lining of transitional cells with their far greater hospitality toward the gonococcus.

Arriving beyond this barrier, as it commonly does, the gonococcus finds things much to its liking Not only can it find a good temporary grazing ground in the transitional-celled walls of the posterior urethra, but it finds it a simple journey into the prostatic follicles and at least, part way up the ejaculatory ducts, where things are far more favorable for it to live and carry on its life's work.

Above the vesical outlet the architect did a far better bit of planning. True, he slipped a little in giving the mucous membrane of the trigone so close an attachment to its subjacent structures but, at least, he did not add a lot of glandular acini to it to keep it constantly bedevilled by the irritating influences of feeding foci. With the general bladder wall ureters and kidney pelves he approached the ideal he placed beneath their linings an abundance of areolar tissue that made it possible for the cells to stretch into squamous-like cells when these organs were dilated and, in some unexplained manner he made the gonococcus dislike them unless their surface became inflamed from other causes. In this there is much for the giving of praise.

Viewing things from the standpoint of time, we find that, during the acute stages of gonococcal infection our attention must be centered both upon those expanses of mucosa covered by columnar cells of the various types and those covered by transi tional cells that are intimately attached to their subjacent struc tures. During the later stages we largely may disregard intrinsic infection in these susceptible transitional-celled areas and view

them solely as suffering from the constant irritation of purulent products exuding from the minute columnar-lined glands emptying upon them. Later as things merge into that stage that we so commonly call "chronic,' we may begin to think rather lightly of the infection of those better-draining expanses with columnar lining in the anterior urethra. Indeed they too, are then the victims of their feeding foci, upon which attention must be centered if cure is to eventuate. It is here that our thoughts must travel on to the influence of anatomic structure in relation to the question of drainage.

VII. THE INFLUENCES OF ANATOMIC STRUCTURE

Through a familiarity with the varying degrees of susceptibility and curative response inherent in different types of tissue, one easily can understand where gonorrheal penetration is possible To stop there would leave him but poorly fitted to follow the course of the disease and to treat it intelligently For there are matters of anatomic conformation that must be understood if their influences would be sensed to the fullest extent. Gonorrhea is a pus-forming disease and like all such disease, the drainage possibilities of the parts affected offer controlling factors of the greatest importance. Not only do they play an important part in the possibility of disease spread but they play one of even greater magnitude in the possibilities for recovery

So fixed are the factors that have to do with disease spread that they lend themselves rather well to enumeration in a series of near rules about as follows

1 There is every reason to believe that the spread of the disease from one mucosa to another is either by continuity of surface or by the mechanical transference of gonococci.

2 So far as the urogenital tract is concerned, there is little to suggest transference by either the lymphatics or blood stream. (We are not here considering metastatic gonorrhea but urogenital progression)

3 The tonic contraction of the cut-off muscle presents a barrier against the surface extension of infection from the anterior to the posterior urethra, though not an absolute one.

4 There is nothing to retard the extension of the disease into either the urethral glands or the acini of the prostate gland.

5 Because of the weakness of the internal sphincter there is little to protect the trigone from infection once it has reached the posterior urethra.

6 The fact that infection rarely passes for long distances through narrow mucous channels by continuity of surface offers great protection to Cowper's glands the seminal vesicles and the

epididymes. Their infection usually is the result of fluid back pressure.

7 Because of their inhospitable mucous membranes, the general bladder wall, ureters and kidney pelves almost invariably escape infection

8 The gonococcus rarely travels for long distances along inhospitable mucous membranes—a fact that seemingly offers much protection to the fallopian tubes in the female, as the uterine mucosa offers this bacterium little encouragement.

Turning to the influences of drainage as it directly concerns the behavior of infection in the various portions of the tract, we find that *in the absence of the other retarding factors* we can predict for freely draining areas at least, reasonable curative reaction. Thus, an expanse like the anterior urethra should go on to gradual recovery If we add to such an expanse an infected follicle, its curative ability is directly dependent upon the drainage possibilities of the follicle. If the latter drains well both will get well. If on the other hand the follicular opening is occluded so that its contents are discharged only intermittently chronicity of infection in both the follicle and its surrounding mucosa will be the result. Should the follicular opening become permanently occluded, the infection of its contents and its walls will undergo a lytic sterilization and its surrounding expanse of mucous membrane freed of its infective feeder will go on to recovery This group of factors again makes it possible for us to lay down another list of near-rules on infective behavior

1 A surface that drains well recovers well.

2 Freely draining expanses of mucosa hold their sensitiveness to gonococcal toxins and continue to discharge as long as they are subjected to the action of associated infective feeders.

3 The tubular gland that drains well gets well.

4 A tubular gland that drains intermittently remains infected for long periods of time and occasions a urethral discharge each time it expels its contents.

5 A tubular gland that does not drain at all undergoes a lytic sterilization and ceases to be a factor in the gonorrheal picture

6. This lytic sterilization makes safe the statement that a mucous structure constantly in contact with the same gonorrheal

pus sterilizes itself (epididymes, urethral follicles, fallopian tubes and certainly, most cases of seminal vesiculitis or the writer is in error about its rarity)

7 Occasionally, tubular glands undergo abscess formation

8 Compound racemose glands usually become abscessed when infected (Cowper's and Bartholin s)

9 Some tubular glands notably the urethral follicles are predisposed to good drainage.

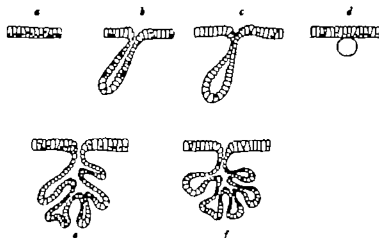


Fig. 36—Diagram to illustrate the influences of drainage upon curative response. *a*, Good drainage and good curative response. *b* Curative response of free mucosa depends upon gland drainage If this is good, curative response in both is good but slower than *a*. *c*, Infiltration around the gland opening causes intermittent drainage and chronicity of infection *d* If completely occluded, lytic sterilization occurs and the gland ceases to be a further factor in the disease. *e* Compound tubular glands such as the prostate are slow in recovering and drainage often must be encouraged by digital stripping *f* Compound racemose glands usually abscess when infected. If they do not it usually is necessary to encourage drainage by digital stripping or to excise them. (Cowper's and Bartholin's glands.)

10 Other tubular glands usually have intermittent drainage (para urethral parafrenal, Skene s and the endocervical glands)

11 The parafrenal glands usually undergo abscess formation when infected.

12 When parafrenal abscesses are incised the depth of the glands behave as do those in number 10

With these points in mind and viewing the lower male genitourinary tract in its entirety we see that in many ways it is ideally

constructed for the prolonged stay of the gonococcus In the anterior urethra we see the possibility of feeding foci remaining for some time in Cowper's glands and those of Littré by virtue of their poorer drainage possibilities. There is every reason to believe that the untraumatized openings of the glands of Littré usually permit of sufficient drainage for the eventual removal of their infective processes through the tissue curative responses and without direct treatment of them. Such, however, is not true of infections of the glands of Cowper For when these are infected and do not go on to abscess formation, they hold infection for great lengths of time unless drainage is promoted by digital kneading of the gland. Fortunately, infections of these glands are rare, usually occurring in those patients who have been subjected to high-pressure urethral treatments or who possess urethral strictures of small caliber distal to the openings from the glands.

Passing backward we find the posterior urethra lying between two tonically contracted sphincters and entirely dependent for free drainage upon the act of urination. Between urinations its contained pus must lie there or if sufficient in amount, it forces its way through the weaker sphincter into the bladder cavity Thus, not only is constant removal of its exuded pus hampered but, during the stage of profuse suppuration, the pus is held there under some pressure, apparently of sufficient force to aid the passage of the gonococcus into the prostatic tubules and on to the true gland acini.

So far as the infection of the prostatic acini is concerned there are years of evidence to show that they usually are capable of sufficient spontaneous drainage to encourage eventual cure without manual efforts to promote better drainage. There, also is abundant evidence that they arrive at the point of cure far more quickly and surely if they are helped in their drainage by periodic digital stripping of the gland. Passing on into the bladder, we find conditions rather ideal for the spontaneous recovery of the trigone from its infection. No sooner does pus exude from the surface than it is enormously diluted by the urine and during the acute stage of trigonal involvement, the highly irritated nerve ends see to it that even the urine does not remain long in contact with its surface.

OTHER INFLUENCING FACTORS

Aside from the influences of histologic and anatomic factors upon the course of gonococcal infections of the urogenital tract, there are a number of things that serve to retard the natural cura tive processes. If one may judge from the Fifteenth Chapter of Leviticus Moses was well aware of some of these and, though of the utmost importance many of them have been viewed rather lightly by succeeding generations That such could be the case is hard to understand on grounds other than a lack of deep interest in the disease itself For some of them are so obvious and so potent for harm as quickly to offset the value of even our best forms of treatment.

Just why these things retard cure is not known but their results are so immediate and often so dramatic as to leave not the slightest doubt about the need for their obliteration from the clinical picture It is a fortunate circumstance for mankind that all but one of them are so easily avoided that they could be over come in most patients by a better type of instruction to the end that greater co-operation is obtained.

One does not need much experience with this disease to recog nize the importance of strict co-operation upon the patient s part. Even with the most dramatic clinical responses obtainable in some patients from the oral administration of sulfanilamide, these fac tors rather obviously play a part in reducing the number of treat ment successes. Among those patients notoriously poor in co-operating with the physician dispensary patients the results obtainable from sulfanilamide have been much inferior to those obtainable in office patients where the standards of co-operation are better And in bed patients where these factors are absent, the results have been almost unbelievably good

Of the things that exercise definite cure-retarding influences alcohol and sexual excitement stand out in bold relief Just why these things have such a marked influence in this direction remains to be answered To solve this riddle would add much to our knowledge of the disease itself and, with the recent attention directed toward gonorrhea it is to be hoped that some keen investigator will find the answer A like influence is injected by

menstruation a fact that makes gonorrhea in the female a more discouraging problem than is that in the male.

Great physical activity in some patients is almost as potent for harm as are the foregoing. This influence usually is more striking in those whose daily tasks are less strenuous but who suddenly indulge in prolonged physical exertion. Those whose usual occupations are of a physically strenuous character at times, are adversely influenced by such activity, though usually not to so marked a degree. True, those who do heavy lifting more commonly are the victims of epididymitis than are others, a fact that adds weight to the later cited causes of that complication.

The taking of long automobile rides acts much the same as does heavy physical activity So true is this that, before the introduction of sulfanilamide one rarely encountered mild gonorrhea in those who habitually drove a hundred miles or more a day and, even on sulfanilamide medication, successes are few among them It is quite common to see the clinical symptoms greatly increased in patients who take but one long auto ride.

It is equally rare to see gonorrhea pursue a mild course going on to prompt cure in men who sleep with their wives during its presence. It is probable that this is due to sexual excitement though many men disclaim such excitement. With them it is only necessary that they sleep alone to cause the disease to reduce in severity and to respond well to the same treatment that previously had been so lacking in results. This has occurred so commonly in the writer's experience that he insists upon his patients sleeping alone. Often, it is not possible to bring about this change in sleeping conditions until the patient is convinced as the result of prolonged erratic disease course, that it may have some value. As a rule a few nights of freedom from the female milieu make such a favorable change in his symptoms that there is little difficulty in prolonging the period of his solitary slumber

To these factors can be added the prolonged inhalation of the fumes of alcohol or ether That the latter is so is readily seen in the behavior of gonorrhea in hospital interns who are in the operating room where ether is being administered In few patients does such a profuse urethral discharge occur The writer has had no opportunity to study the action of sulfanilamide on such

cases but has no hesitancy about predicting that they all will be numbered among the drug failures

Under the former methods of treatment, workers in alcohol fumes behaved in the same way as did our younger brothers in the operating room. It is highly probable that a study of some of those industries where individuals spend many hours in an atmosphere of the fumes of other chemicals would greatly lengthen our list and would urge their withdrawal from the vicious surroundings as a prerequisite to cure Such a study would add much to our present knowledge and might do much to lighten a heavy load from the already burdened shoulders of industry

VIII. THE DIAGNOSIS OF GONORRHEA

To the careful clinician the absolute diagnosis of gonorrhea rests solely upon the demonstration by one means or another that the gonococcus is present. He does not feel justified in making a diagnosis of this disease, certainly not in the male solely because his patient has been exposed to possible infection and has developed symptoms similar to those seen in gonorrheal patients. He sees far too many cases of nonspecific urethritis presenting identical symptoms with those of gonorrhea itself to make him lean with much confidence upon diagnoses thus arrived at.

This attitude upon his part is a decided "thorn in the side" to those much harassed individuals who spend their days in epidemiologic efforts to protect society from the ravages of this disease and their nights in dream-warfare against an obstructing medical dogma. To them we often seem to be a group of timid, spineless creatures who will make a diagnosis of almost everything else from a suggestive history and a few symptoms and yet, have not the courage to say a patient has gonorrhea unless we find the offending germ. They can see little rhyme or reason in our unwillingness to extract their grief-coals from the social fire, to stand up bravely and say that this or that patient has gonorrhea when what we feel is our sole proof is lacking Seemingly they disregard the fact that what we unhesitatingly call a gonococcus their own laboratories call A gram-negative intracellular diplococcus with the morphologic and tinctorial characteristics of the gonococcus." This, however is no great misfortune for us even if it may at times appear timid and spineless on their parts We have the patient with his symptoms. They have only the spread of pus and no matter how they describe the gonococcus to us we make the diagnosis of gonorrhea on the strength of the combined findings, which is as it should be.

Of course, the health officer's troubles along this line have to do more with those who treat gonorrhea in the female than with the male aspects of the problem And one would be uncharitable to suggest that he is not worthy of our sympathy and our help

where it can be given To view him as a different kind of creature is to overlook the fact that every physician is in reality a health officer with unescapable social responsibilities Were we faced with the problem of controlling the prostitute until she no longer carries the gonococcus, we would find ourselves of the same frame of mind regarding professional unwillingness to say that she had gonorrhea just because we could not demonstrate the presence of the gonococcus and we would cry for help In this regard, however, it is not immediately apparent that either will come over to the camp of the other For which reason, it might be well for each to turn his attention to the development of better ways of finding the gonococcus when it is present.

To this end, as has been stated, there is great need that there be a more frequent resort to cultural methods and that laboratories fit themselves to make these studies in such a way as to command the confidence and respect of those who wish to avail themselves of their possible greater safety Particularly is this true of gonorrhea in the female and, since the introduction of sulfanilamide, it has become almost equally so of the male.

In increasing numbers male patients entirely devoid of symptoms are presenting themselves to the physician for an opinion as to the cure of a recent gonorrhea treated by sulfanilamide. This, together with the fact that one s own seemingly cured cases present a diagnostic problem of no small proportions, renders imperative the employment of far more careful studies than heretofore have been greatly needed. Before the use of this drug it only was necessary to employ some provocative method to cause the return of symptoms which made possible the easy demonstration of the gonococcus in the urethral discharge thus caused. The lack of a toxin response after such provocations in the patient whose urethral discharge has disappeared following such medication is the rule rather than the exception and, in the absence of such a recrudescence of symptoms one must search farther than the urethral fluids if he would find the gonococcus. He must turn more often to prostatic secretions seminal fluids and urinary sediments. And, if he would have confidence in his findings he must use a technic in the preparation of these fluids that makes for clear delineation of their cellular and bacterial constituents.

All of these fluids in their unaltered condition fix poorly to the slide and, as a rule, their microscopic study is difficult and productive of great uncertainty Properly prepared, however, they are even more satisfactorily studied than most spreads of urethral pus. Thus, it will be of value to outline a technic of preparation that produces these more reliable results

The sediment of centrifugated urine, unless it contains much pus or some albumin, usually is washed off during the process of staining If the urine be of a high specific gravity the contained leukocytes are so small and compact that intracellular bacteria are seen with difficulty or not at all. Both of these can be overcome by the following method

1 Centrifugate a tube of urine at high speed

2 Pour off the urine by quickly inverting the tube. The sediment will remain in the tip of the tube

3 Fill the tube three fourths full of either normal salt solution or distilled water and shake vigorously until the sediment has been washed into the fluid.

4 Recentrifugate

5 Invert the tube and obtain the sedimented material from its tip with either a platinum loop or a very small cotton wrapped applicator

6 Spread thinly on slide, fix with gentle heat and stain by Gram's method

The choice between salt solution or distilled water as a washing medium is not always one of great importance. If there is much mucus present distilled water is the better despite the fact that it often breaks the leukocyte wall so that the intracellular location of bacteria commonly must be assumed because they are close to the nucleus. Salt solution usually does not rupture the leukocyte wall, though it spreads the cell widely and it leaves no doubt about whether or not bacteria are in the cell

THE PREPARATION OF PROSTATIC AND SEMINAL FLUIDS

Both of these fluids adhere so poorly to the slide that they are likely to be washed from it during the process of staining Even when they do adhere, the leukocytes are likely to be so small that intracellular bacteria are seen with difficulty if at all. The non-

cellular parts of these fluids take the counterstain in such a way as to make careful study extremely difficult. With prostatic fluid the cells are clustered closely together, while the areas around them are weblike in appearance With seminal fluid the cells are likely to be in clusters while the entire background is more palely stained with the color of the counterstain. In order to clear the fluids of these obscuring backgrounds, swell the cells so that the protoplasm is wider and to break up the clusters the following method is advisable

1 Allow the fluids to flow into a test tube about three fourths full of either salt solution or distilled water and shake until admixed

2 Centrifugate at high speed.

3 Invert the tube and keep it inverted until the material for study is obtained in the way described under the treatment of urinary sediments.

4 Spread thinly on a slide, fix with gentle heat and stain by Gram s method.

If one is interested in finding the gonococcus and not trying to determine its source these procedures can be combined into one by digitally stripping the urethra, instructing the patient to compress that canal while his prostate and seminal vesicles are digitally stripped per rectum and then having him pass a small quantity of urine in a beaker This can be centrifugated and carried through the procedure previously described for the study of urinary sediment.

It is seldom indeed that these procedures do not reveal the gonococcus if it is present. One however should not be too sanguine about a single negative finding. The gonococcus is an extremely small body and it is not always present in great numbers for which reasons several prolonged studies should be indulged in before confidence soars to too great heights. This is particularly true in patients seemingly cured by sulfanilamide, and it is well where possible to make such studies after one or more of the several later described provocative procedures have been indulged in Even then mistakes are possible and, where the gonococcus has not been found it often is best to resort to cultural methods Such studies should not be carried out while

the patient is still taking sulfanilamide. It is far safer to allow a period of two weeks to elapse before much credence can be placed in negative findings Even then, they should be restudied at weekly intervals for several weeks. In the interim the patient should have microscope slides with him and should be instructed how to make a spread of any urethral discharge he may have.

CULTURAL VS. MICROSCOPIC DIAGNOSIS

Apparently we have advanced at last from our old and, often, stumbling ways of gonococcus culture. Many of the older arguments have been put aside in comfortable resting places and far more of them have disappeared from present-day consideration. Those that were soundly based have survived to make an attractively firm foundation for a far better type of laboratory work wherein many of the older uncertainties cease to harass the bacteriologist to a point of shunning cultural work with this bacterium. Not only is it now possible to grow the gonococcus with ease and certainty but, through the recent additions that have been made in the differentiation of this microorganism from the confusing ones that so often accompany it, a trained bacteriologist has little trouble in proving that he really has isolated the gonococcus.

As is later stated, it is apparent that the older difficulties still linger in men s minds sufficiently to deter them from giving the matter the attention it so urgently needs That laboratories throughout the country have not risen to the occasion is well shown by the responses to a questionnaire sent recently to the municipal laboratories in all of our cities having a population of 50,000 or over These results are given in an article by Leahy and Carpenter[1] as follows "Only 37 of the 145 laboratories which returned the questionnaire stated that cultivation of the gonococcus was attempted. Fourteen of this group gave no data concerning their results, while the remaining 23 reported the isolation of the organism. Of the 23 laboratories 7 were frequently successful, 5 occasionally successful and the results from the remaining 11 varied from 5 to 75 per cent isolation, the percentage being computed on the basis of smear examination. Only 2 laboratories

[1] Am J Syph Gonor & Ven Dis 20: 347 1936.

reported diagnosing more cases of gonococcal infection by means of cultures than smears "

That these conditions are greatly in need of correction is shown by the results of many studies carried out to determine the comparative values of the smear and culture methods It is the opinion of all of those who have worked on the problem that gonococci frequently can be cultured from the secretions of those showing persistently negative smears This is particularly so of both the female child and the adult. Neuman[1] cites such a study among 537 prostitutes in whom gonococci were demonstrated by first culture in 42 who gave negative microscopic studies. Schubert was able to culture gonococci from 13 (7 5 per cent) of *175 patients male and female, in whom smear studies failed to* reveal those organisms. Cohn[2] cultured gonococci from 6 children who were negative by the smear method in a group of 28 cases. And Carpenter Leahy and Wilson[3] in a study of 245 female patients found cultures positive in 205 (91 9 per cent) and smears positive in only 107 (48 per cent) In other words, cultural methods in their hands proved to be almost twice as reliable as were the microscopic studies of smears

THE COLLECTION OF MATERIAL FOR CULTURAL STUDIES

In the male the collection of secretions for cultural studies for gonococci is a very simple matter One merely has to wash the glans penis with alcohol to strip the prostate, seminal vesicles and the urethra and have the patient pass, immediately thereafter a small quantity of urine into a sterile container Such specimens should be placed in the hands of the bacteriologist preferably within a few hours If a longer time is necessary it is best to place them in the ice box for as much of this waiting period as is possible. It, therefore is only necessary that alcohol and sterile containers be at hand.

In the female the story is by no means such a simple one as cultures must be taken from the cervical canal the urethra and perhaps from the orifices of Bartholin s glands Here however

Dermat Ztschr Berlin 78: 125 1937
Am. J Syph Gonor & Ven. Dis. 20: 623 1936
Ibid 22 55 1938

there is not required any great amount of paraphernalia. All that is needed are sterile applicators, tubes of sterile broth and a vaginal speculum. The vulva should be wiped with cotton upon which no antiseptic is used. The urethra should be stripped, an applicator passed into it and immediately placed in one of the tubes of broth. If fluid can be pressed from Bartholin's glands it should be treated in the same manner. A speculum should be introduced into the vagina, the cervical surface wiped with cotton, the plug of mucus removed from the cervical canal with a dry applicator and the cervix firmly squeezed either with the blades of a bivalve speculum or a pair of forceps. An applicator then is passed into the cervical canal, rubbed firmly against its walls and immediately placed in a tube of sterile broth. These also should be placed in the ice box until they can be transported to the laboratory.

THE MICROSCOPIC INTERPRETATION OF URETHRAL DISCHARGES

The microscopic study of stained smears of the urethral discharges is of the greatest diagnostic value. Only by such a procedure can those discharges that are of gonococcal origin be differentiated from those that are not, for they have no constant macroscopic differences. In points of importance they differ so widely, however, as to make the neglect of microscopy the height of unfairness to the patient.

Throughout the years there has been much effort expended toward giving these studies a wider range of value, particularly in so far as the question of prognosis was concerned. Certain general impressions have been created that are not altogether in accord with the scientific facts. Particularly has this been evidenced in regard to what one might call the "phagocytic index" of such discharges, meaning the number of leukocytes per hundred that show phagocytic activity. By some it has been urged that marked phagocytosis was evidence of a high degree of resistive power upon the part of the infected individual. In other words, the higher the "phagocytic index," the sooner the individual recovered from his infection. Just how such an idea, having so little foundation in fact, could have gained such wide credence is hard to say. It was rather generally believed before Wright's work upon the opsonic index and more generally so since.

A close study of this interesting phenomenon shows the truth to be at wide variance with such a conception. There seems to be only one clinical occurrence to give support to such a view, and that one is rarely encountered and even then is inconstant. We shall see elsewhere, that perhaps one individual out of about every 200 of those infected by the gonococcus is extremely tardy in the development of any appreciable amount of curative response. Such an individual it makes little difference what plan of treatment is used continues to have an urethral discharge week

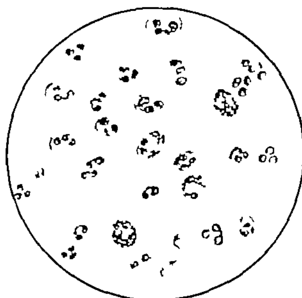


Fig 37 —During the florid stage of the disease there are few if any epithelial cells in the discharge and the gonococci are usually all intracellular

after week. The clinical manifestations of his infection change very little in long periods of time. Singularly enough, these individuals at times will have an urethral discharge in which the gonococci are practically all outside of the leukocyte in which there is little or no evidence of phagocytosis. Seen at such a time they seem to offer good evidence of the accuracy of the belief previously mentioned The extracellular location of their gonococci however is not constant for the same individuals will show long periods wherein the phagocytic index is extremely high and in whose discharges there seem to be no extracellular gonococci

Thomson has cited the complete absence of phagocytosis seen in three individuals with prolonged gonorrhea, two of whom had had energetic treatment with gonococcal vaccines. At first glance such an observation would seem to be of great value, but the writer's experiences have not been such as to make him feel that isolated observations lend much toward the solution of the question. If continued over any length of time the microscopic picture reverses itself too frequently

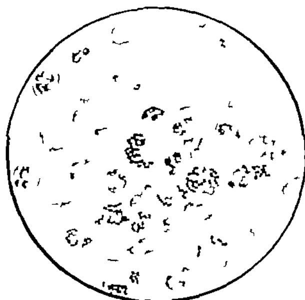


Fig. 13.—On the first day of a gonorrheal discharge it is common to find both intracellular and extracellular gonococci, as well as a few epithelial cells. The same picture is commonly seen in the subsiding stages of the disease.

Dr L. A. Markley carried out for the writer a larger number of phagocytic index counts on a number of patients. These were carried out from early in the disease on for an average of forty eight days. From an analysis of his chart, upon which have been superimposed graphic charts of the urine trends one is forced to the following conclusions

1 The ratio between the intracellular and extracellular location of gonococci in urethral discharges varies too greatly to be of prognostic value.

2 Such high phagocytic indices occur so commonly in chronic gonorrhea as to throw a grave doubt upon the phenomenon as a safe index of curative progression

3 The phagocytic index depends upon the number of gonococci present, and as there are usually more in the early stages the index is usually higher

4 There is no definite relation between the phagocytic index and the amount of urethral discharge, as a profuse discharge may contain comparatively few gonococci and a scanty one the reverse.

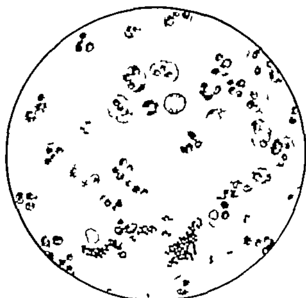


Fig 39—A urethral discharge showing all of the contained gonococci placed extracellularly A stained smear taken from this same patient a few days later showed all of the bacteria within the leukocytes.

5 The clinical manifestations bear no fixed relation to the number of gonococci in the discharge they are the results of individual factors the varying responses to gonococcal toxins and are not to be measured by microscopy

6 The entire work, though highly interesting is but a testimony to Dr Markley's diligence and patience It has no greater value than to show the futility of studies of the phagocytic index so far as they offer us any help in our understanding of a given case of gonorrhea.

Aside from the determination of the presence or absence of the gonococcus the greater value in our studies of these urethral discharges is to be found in their cytologic characteristics While these have no such wide range of diagnostic or prognostic utility as some have tried to give them, they at times do furnish us with some valuable information The most important points brought out by studies of the cellular elements in urethral dis charges can be enumerated about as follows

1 Though a few epithelial cells are present in most discharges the polymorphonuclear leukocyte predominates in gon orrhea.

2 During the florid stage of gonorrhea the number of epi thelial cells is commonly determined by the type of treatment used, and is not a characteristic of the disease per se

3 The presence of large numbers of epithelial cells during the florid stage of gonorrhea almost invariably means the given urethra is being treated by stronger chemicals than it should be. The occasional exception to this is due to stricture of small caliber

4 The presence of large numbers of squamous cells in a chronic discharge indicates either much traumatic urethral treat ment or a stricture of small caliber The history and the size of the urinary stream quickly give the answer

5 The presence of eosinophils in late gonorrhea is an inter esting phenomenon upon which we have been able to place no significance.

Added knowledge is to be gained by a study of the kinds of bacteria present in the urethral discharge. In gonorrhea between the second and fifth days the gonococcus has the field to itself After this the other bacteria particularly staphylococci, begin to make their appearance The more numerous these secondary invaders, the less numerous are the gonococci. In the presence of urethral stricture or a long prepuce, these secondary bac teria may and commonly do increase in numbers very rapidly so that within a few days the gonococci are by far in the minority while there are hordes of bacteria of many types So true is this that the presence of a large assortment of bacteria in the subsid ing stages of the disease in a patient without a redundant prepuce almost always means that he has a urethral stricture

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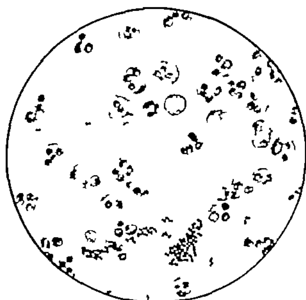


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IX. MODES OF INFECTION

In the male of all ages gonorrhea is practically always the result of sexual contact. Accidental infection is of such rare occurrence that one almost can dismiss the matter from scientific discussion. Few things in life are more conducive to the most strenuous efforts at deception than are gonococcal infections in male children, youths and married men. In others one rarely has any difficulty whatever in revealing the fact that there was such a direct contact. The contact need not be of a necessity per vaginam, it may be rectal or buccal.

In male babies and small children careful searching practically always will reveal that either a nursemaid or some girl who is in close contact with the child not only has gonorrhea but has placed the child's penis in contact with her vulva.

Patients occasionally are encountered who firmly insist that they have not "been with a woman for months" Almost invariably these patients have acquired their infections from either buccal or rectal coitus When accused of it they shamefully admit it.

One does not encounter so many efforts toward deception today among married men as formerly was the case. The greater sexual freedom of the day largely has banished the shame element which was so much in evidence but a few short years ago There are encountered individuals who try to cover their recent sexual transgressions by denying contacts and blaming the infection upon the recurrence of an old one This is particularly true where young married men consult their older family physicians. And even older men try the same tactics at times. In the specialist's office, for one reason or another they rarely make strenuous efforts at such deception Perhaps they think he knows too much about such matters to be fooled

Where one tries such a technic it is well for the physician not to be too blunt in his contradictions however It is becoming increasingly common for men to contract gonorrhea from erring wives and the exercise of a little tact may be the means of saving

a home. Though present epidemiologic procedure urges the absolute need for getting all of the infected under treatment, one does *not have to be in such a hurry that he raises suspicions that might* not enter the picture if a little more time and consideration were given to the surrounding circumstances.

Despite the fact that seeming contradictions appear in the literature from time to time, the writer has no hesitancy about saying that this disease does not lurk around the male for years without making its presence known from time to time. The fact that one physician reports the recurrence of a thirty year old gonorrhea after the patient was operated upon, having been in the hospital for some weeks is not the swallow that makes the summer *The writer's friend, Dr Stahlnaker, had an identical case*, only he went a little further and found that the patient's nurse also had gonorrhea.

Whether the carrier states which at times result from sulfanilamide will force a change in the above opinion remains to be seen The evidence so far is against a need for change, for, though such patients may remain symptom-free despite sexual intercourse and alcohol for some time, this quiescence gradually is lost. Most surely it will not last a year

In getting histories of sex contacts from those who deny them, one gets little truth if he seems to sit in judgment upon the patient. There is no surer way to make the patient stick to his story He tells his story most freely to the doctor who hints or says that he has done the same things himself

The patient is not always consciously lying if he says he 'had some drinks but there was nothing sexual' The writer has known of a number of patients who were sure they were too drunk to perform sexually and yet had To one of this conviction who had spent a night in a house of prostitution the writer suggested that he ask his friends who were with him what he had done He was sure *that he sat downstairs drinking until he became so intoxicated that they put him to bed* The answer he got from both of the friends who were with him was, that he had had intercourse with two women and with a third one was too drunk to do anything but go into a profound stupor which lasted until late the next morning

X. THE PERIOD OF INCUBATION

For many years it has been our custom to explain away that period elapsing between the acquisition and the clinical evidence of gonorrhea by saying that it was the period required for the transit and tissue penetration of the gonococcus. As we study more closely the data upon this phase of the disease it is easy to see that this only partially explains. It was shown by Finger many years ago that tissue penetration was far advanced at the end of thirty-six hours and, yet, we must wait usually another thirty-six hours for the clinical manifestations

Turning to a consideration of the life cycle of the gonococcus and the fact that its toxin is endocellular it is obvious that there is really more to this period of incubation than we have thought. Not only must the germ penetrate but it must complete its life cycle and liberate its endotoxin after which some hours elapse for the generation of the true tissue responses. Consequently our incubation period comprises the time required for transit along the urethral surface, penetration into the deeper mucosal layers, completion of the life cycle of a sufficiently large number of gonococci to liberate their endotoxin as well as the time required for a toxin tissue response Evidently the time required for the bac teria to spread along the urethra is not much of a factor as the incubation period in the male does not differ from that in the female where the gonococcus frequently is engrafted directly upon columnar epithelium

With a bacterium so susceptible to time changes in its life cycle it is but natural that cases should occur wherein the clinical evidences of the disease were delayed far beyond a necessary minimum of time Culturally almost any variation beyond this minimum can be produced. The "lag period" can be prolonged greatly by slight adverse circumstances, as can the period preced ing autolysis It is clinically evident that, even with the same "strain" of bacteria different urethrae show the widest range of

reactions as to time and virulence. So pronounced is this that it is obvious that gonorrhea is really an individual disease and, as differ the food and environment of the germ, so differ the time and degree of the tissue responses.

From much clinical observation, as well as many artificial inoculations reported by Finger and others it is evident that we must consider that our minimum incubation time in gonorrhea is greater than forty-eight hours It is more often seventy-two hours or longer Urethral discharges occurring at shorter periods than forty-eight hours are not new infections Consequently we are safe in stating that no discharge appearing within forty-eight hours is due to a newly acquired gonorrhea, but probably is a toxin response from the patient's older latent infection. We must not lose sight of the fact that it also may be from a sexual contact shortly antedating the suspected one, and that the disease may have been given, and not gotten, on the later occasion.

While clinically the usual period of incubation is from three to five days, one occasionally sees patients who have developed an urethral discharge one or more weeks after exposure. Such delayed periods of incubation are probably more apparent than real. It is probable the disease was present in such a mild form that the patient was not aware of it until he indulged in something that acted as an exciting factor This is well illustrated by the case of a medical student who six weeks after a week's wild sexual orgy developed a profuse gonorrheal discharge the morning after the consumption of a large quantity of alcoholic drink, though he had had no sexual exposure in the meantime.

Another case in point is that of one of two young men exposed to the same source of infection. One developed a florid gonorrhea promptly but the other showed no sign of the disease. Smears of the urethral mucus of the latter were negative for gonococci and pus for a week after the former had developed the disease. At this time, the one hitherto showing no symptoms consumed a fair quantity of wine, and upon the following morning had a purulent discharge containing countless intracellular gonococci

From such occurrences it is obvious that much care should be taken in proving that infection does not exist in the increasing number of married individuals who consult doctors in fear that

they may have acquired the disease. It is patent that alcohol, for example, at times can reveal infections that are a decided menace because of their latency And there is great value in withholding opinion until the patient has been studied after the con sumption of alcoholic drinks

XI THE CAUSES OF LOCAL SYMPTOMS

The closer study of the conditions underlying the occurrence of the purulent responses of gonorrhea brings out many things of interest and of value in our understanding of the disease We have overlooked a number of things in this regard and have accepted too fully the belief that the recrudescences of these objective symptoms after periods of comparative quiescence were due to reinfections as the result of the emptying of retained bacteria into the urethral canal. That this cannot be true is amply borne out by the time required for the appearance of the urethral discharge as well as the duration of it following the several causal factors

It was pointed out in our consideration of the products of gonococcal disintegration that the urethral discharge was due to the irritative action of the endocellular toxins In order to liberate these toxins the gonococcus must complete its life cycle and its cell wall must rupture *There is little to suggest that exotoxins* play a part if indeed, there are such substances liberated by the gonococcus In the pathologic picture of the disease it is apparent that there occur many opportunities for the storing up of these poisons as well as their subsequent evacuation into the urethral lumen. The infection passes into such mucous channels as the glands of Littré crypts of Morgagni or prostatic follicles. Due to the mucosal swelling their outlets become blocked so that the pus and bacteria in their depths disintegrate These retained products should therefore be rich in gonotoxin and if suddenly evacuated should cause an increase in urethral discharge providing there is sufficient toxin present.

It is much in evidence that the urethra rarely becomes desensitized to gonotoxin during the first few months of the disease. In fact, there is more reason to believe that it becomes increasingly sensitized so that very minute quantities of gonotoxin create responses almost—if not quite—equal to those of the larger quantities during the earlier quiescent periods of the disease

Mucosal gonotoxin desensitization is solely a product of prolonged or repeated infections by the same "strain" of gonococci. Some individuals never develop it and, in some it appears to be developed, then lost and, possibly, redeveloped. It is not effective against the toxins of another "strain."

Following the injection of gonotoxin (vaccine) into either the normal or the quiescent gonorrheal urethra there appears a profuse purulent discharge in from four to twelve hours. This discharge generally subsides by the end of forty-eight hours. Such

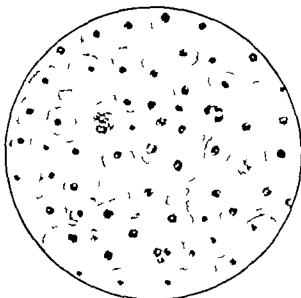


Fig. 40.—Platinum-loop scraping from the fossa navicularis prior to the injection of gonotoxin into the anterior urethra. No urethral discharge present.

a response agrees in every way with those seen so commonly as the result of untoward events during the course of the disease, and which we have always called reinfections. Against their being due to the liberation of viable gonococci into the urethral lumen, and reinfections therefrom, stand several things that have been sufficiently substantiated to be called facts. It must not be forgotten that superinfection by one's own "strain" of gonococci is rarely possible, whereas the purulent responses in question practically always occur. Further, it has been shown repeatedly that

where superinfection was possible, there was a period of over forty-eight hours intervening between the inoculation and the appearance of discharge and that the resultant superinfection differed little in its course, if at all, from the original infection. The discharge of which we speak usually occurs well within twelve hours of the event causing it, and has subsided into complete or comparative inactivity before the discharge due to reinfection or superinfection could appear

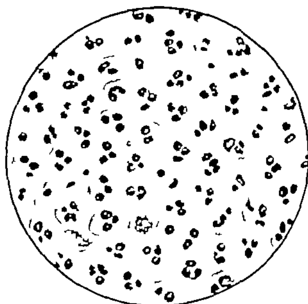


Fig. 41—Nonbacterial urethral discharge four hours after the anterior urethral injection of gonotoxin

From the data available as well as our common clinical observations it therefore is obvious that these so-called "flare-ups" so commonly seen in the course of the disease as the result of alcohol, sexual excitement or direct trauma to the urogenital tract are mucosal toxin responses and not in any sense reinfections. The fact that gonococci can be demonstrated in such discharges does not disprove such a statement, for it is not to be supposed that all of the organisms in the retained pus were autolyzed and the liberation of the viable ones should occasion their rapid multiplication in the better culture medium

There is abundant clinical evidence to show that repeated toxin responses following periods of quiescence do much to upset the delicate immunity balance of the disease. They are potent factors tending toward chronicity

One could indulge in much interesting speculation regarding the obscure tissue processes leading to these toxin responses as the result of the well known clinical occurrences producing them Those occurring as the result of the passage of urethral instruments too early in the disease and the digital manipulation of a gonorrheal prostate or infected urethral follicle easily can be attributed to pressure evacuation. On the other hand, those following sexual excitement probably are due to the increase of glandular activity physiologic to this state. The responses following the ingestion of alcohol however, are not so easily understood, and are well worthy of close study They may be due to the supposed "wet mucosa" of alcohol and the secretory activity consequent thereto or they could be the result of the reputed checking of phagocytosis due to alcohol in quantity and the consequent liberation of more gonotoxin.

The rôle of the repeated recrudescences in retarding cure is likewise a fertile field for speculation. In it one finds many apparent contradictions and much that mystifies. From the general picture of the disease, viewed in the light of our knowledge of immunity processes in other diseases, it might appear that longevity of the infection was due largely to insufficient antigenic substances to stimulate the body's feeble immunity processes. Under such circumstances we would expect that such "flare-ups" would be of benefit in that they would cause increased antigen absorption. During the first few months of the disease they however have a definitely deleterious effect whereas, in the presence of chronic gonococcal infections such recrudescences not only may be beneficial but are, at times, the apparent factor in promoting cure. Certainly we have much to learn regarding these seemingly contradictory functions of the body and the local tissues.

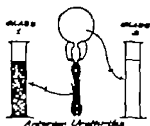
XII. THE TWO-GLASS TEST

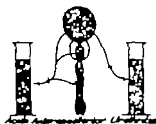
OUR simplest and most reliable means of following the course of the infection is by observation of the character of the voided urine To this end it has been the custom in routine work to make use of the two-glass test. Obviously this test is only of value during the active stages its value ceases when the disease has reached marked latency It is really strange how such a simple test can be confused so thoroughly in the medical mind as this often is The most common misconception in regard to it is to view the occurrence of a cloudy first glass and a clear second glass of urine as proof that the anterior urethra alone is the seat of infection. So commonly are such misinterpretations made, that it will not be in any sense a waste of time to go over the matter briefly

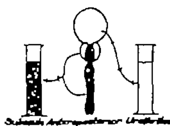
If the urinary bladder is full of clear urine and the patient voids 2 ounces or more of urine into one glass and the balance into a second glass, he obviously will wash out any pus or shreds that may be in any portion of his urethra into the first glass, so that the second glass will be clear It would make no difference if it were a small quantity of pus or shreds in the posterior or in the anterior urethra they would go into the first glass.

Should there be such a large amount of pus produced in the posterior urethra between urinations that it forced its way through the weaker sphincter at the vesical outlet back into the bladder there would be no clear urine for a clear second glass. The first glass would contain the urethral pus in the already cloudy bladder urine and the second would be slightly less cloudy from what pus passed into the bladder from the posterior urethra and that due to the trigonal infection It is evident that the formation of pus by the trigonal mucosa quickly stops so that it is usually a factor in only the first few days of posterior involvement The clouding of this second glass of urine after the subsidence of the trigonal suppuration would be entirely dependent upon their being sufficient pus formed in the posterior urethra between urinations to force the vesical sphincter When this did not occur the urine

would revert to the former condition, first glass cloudy and the second glass clear but would not in any sense prove that the







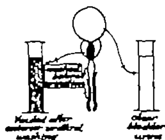


Fig. 42

posterior urethra was not infected. In other words, soiling of the second glass of voided urine after the subsidence of trigonal in-

flammation, is entirely a matter of the *quantity* of pus formed in the posterior urethra between urinations.

The degree of cloudiness is but an index of the amount of pus and the amount of pus is an index of the activity of the infection. Obviously, therefore it is a simple matter to follow the progress of a given case if one properly can interpret the two-glass test. This will be considered further in the section on "The Clinical Course of Gonorrhea," but it is well for us to remember certain peculiarities of this test and what they mean For the test to be of most value the patient should have retained his urine for a sufficient period to allow of the accumulation of his average amount of pus, preferably for one and one-half hours, or longer In the presence of marked posterior irritation this, of course, cannot be done, but there should be some uniformity established regarding it. Interpretations based upon less than 2 ounces of voided urine for the first glass are usually worthless.

The degree of cloudiness or haziness is dependent upon perfectly obvious and easily elicited factors and needs no comment. Beyond this, one has but to remember that the presence of shreds denotes either a subsiding acute condition latency or chronicity either of which is easily determined from the history of the case under study

The purport of the various combinations observed in the study of the two-glass test can be tabulated briefly as follows

First glass	Second glass	
Cloudy	Clear	(*a*) Acute anterior urethritis (*b*) Acute anterior urethritis with mild or subsiding posterior involvement.
Hazy	Clear	(*a*) Mild, acute or subacute anterior urethritis (*b*) Mild, acute or subacute anterior urethritis with mild posterior involvement.
Shreds	Clear	(*a*) Subsiding anterior urethritis. (*b*) Subsiding anteroposterior urethritis (*c*) Chronic urethritis, generally as the result of deeper foci of infection in the prostate or other associated small channels
Cloudy	Cloudy	(*a*) Acute anteroposterior urethritis (*b*) Cystitis or upper-tract suppuration.
Hazy	Hazy	(*a*) Subacute or mild anteroposterior urethritis (*b*) Bacteriuria. (*c*) Cystitis or upper-tract suppuration.
Clear	Cloudy	(*a*) Seminal fluid (*b*) Contents of pus pocket (*c*) Sedimented mucus, or phosphates from a poorly emptying bladder (*d*) Slight terminal bleeding.

One should not forget the importance of ruling out cloudiness due to phosphates by the addition of acetic acid or possibly, urates by the application of heat. It is rare to see cloudiness in freshly voided urine, as the result of causes other than those mentioned. In patients taking large quantities of balsamics it is not uncommon to see an increase in the cloudiness of the urine upon the addition of acetic acid.

To determine the presence or absence of mild or subsiding posterior urethritis in the presence of a clear second glass of urine it is at times necessary to irrigate the anterior urethra to remove any contained pus or shreds so that the first glass of urine voided contains only the substances washed from the posterior urethra by the voided urine.

There have been devised various additions to the two-glass test. Some of these use as many as seven glasses and are of questionable value. They are aimed at determining the presence of pus in such structures as the prostate and seminal vesicles Judging of the presence of pus in secretions themselves opaque by the extent to which they render the urine opaque, has too large a margin of error to approach even fair accuracy These secretions can be studied best under the microscope, by the use of which accuracy supplants much poor guesswork.

XIII. THE CLINICAL COURSE OF GONORRHEA

THE introduction of sulfanilamide into the treatment of gonorrhea has served in no sense to clear up the rather general confusion regarding the clinical course of the disease. In fact, in many ways it has deepened this confusion in that it has added variations not often seen before its use—variations that commonly are of the most misleading character. So true is this that one no longer can place so great a reliance upon that simplest and most useful of all methods of following the disease course—the two-glass test—in patients to whom this drug has been administered. As our experiences increase and we wander on past the romance stage of this great discovery it becomes more and more evident that though the picture is broadened in scope, there is just as great a need for that fund of knowledge that we gathered throughout the years. In other words, we still need the old and simply must add to it what our experiences with the new give us warrant for thinking is sanely based.

It was pointed out in the previous edition of this work that what is termed 'lack of resistance' is only occasionally a factor in altering the clinical course of gonorrhea. When it does play a part it usually serves only to prolong the several stages of the disease rather than greatly to alter its general course. Just how great a part it plays in the precipitation of complications is impossible to say. There is little to suggest that those individuals who, in the absence of demonstrable adverse influences generally producing such things, follow a disease course that we always have been pleased to call virulent, have any greater number of the usually preventable complications than have those whose disease runs the shorter, milder course so far as urethral evidences are concerned.

Under the consideration of "The Causes of Complications" it is stated that, aside from posterior urethral involvement with its usually concomitant prostatic infection, over 90 per cent of the complications of gonorrhea in the male occur as the result of easily avoidable influences. And there is little to suggest that those in-

fluences are more prone to create complications in those with tardy curative responses than in others Indeed, the frequency with which one encounters patients whose disease has continued in a highly active state for long periods of time during which these complication-encouraging factors repeatedly have been present without the production of such complications, would tend to add much weight to the belief that tardy curative response is not to any great degree a factor in the marked variations in course that complications produce

In this regard, later experience has convinced the writer that his former belief that blonds as a class were particularly prone to run a prolonged disease course beset with great likelihood of complications was a little overdrawn He likewise sees the necessity for abandoning a former conviction that Latin Americans were similarly singled out for slow immunity responses His old saying that, Blonds and Latin Americans think they are the salt of the earth and the gonococcus thinks they are too " no longer is tenable. Of course blonds do think they are the salt of the earth but the opinion of the gonococcus is not a great factor in their common differences in disease course The secret of the matter really is that the women think as the blonds do and the blonds find it harder to avoid sexual excitement long enough to give immunity responses a chance to develop Gonorrhea in strictly co-operative blonds behaves as it does in other well behaved males The Latin Americans approach the same influence from another angle Some one once convinced them that they have "hot blood which they interpreted as meaning that they must have sex outlets—gonorrhea or no gonorrhea. One almost cannot avoid the fairer sex and the other will not. The disease answer in both is the same

The more closely one studies those cases presenting the pronounced early symptoms that always have been attributed to virulence of infection the more he will become convinced that bacterial virulence plays little if any part in the matter For almost invariably these are the patients who have subjected themselves to either sexual intercourse alcohol or both during the last day or two of the period of incubation as previously has been stated.

Thus in our studies of the course of this disease it is found that we do not have to consider its victims under a vast number of different classifications If we divide them primarily into those patients in whom the disease does not pass beyond the membranous urethra and those in whom it does, we greatly narrow the field. It really is not of great importance to place in a different category those patients who are, or seemingly are, cured promptly by sulfanilamide. Most of us have seen patients in whom local treat ment alone *caused almost as prompt a disappearance of symptoms* —patients in whom the disease course was practically identical with the most dramatic of sulfanilamide cases—and we now see no reason why they should be classified separately There never have been fixed rules of disease course in gonorrhea, there are none today and there probably never will be There are definite trends however which make it possible to court clarity in divid ing cases into the two great subdivisions of anterior and antero-posterior infections. What changes complications, treatment and other things make in these trends can be easily considered as disease variants due to their several causes We even might place sulfanilamide-treated cases among our variants to make description clearer So for a while, let us forget all about sulfanilamide and think of gonorrhea itself We can consider the former in a later chapter

Gonorrhea in the male is a disease wherein pus is poured into the urine-conducting structures. The more active the disease the larger is the amount of pus As the curative reactions develop the pus gradually reduces in quantity until it finally disappears. The disappearance of pus is in no sense an evidence of cure as the gonococcus may linger long after there are no visible evidences of its presence. The pus that is poured out not only escapes from the urinary meatus but, also is washed out as the urine is passed, a fact that makes it possible to follow the course of the disease by a visual study of the extent to which the normally clear urine is clouded by the pus formed between urinations The purport of these various urinary pictures is described under the heading of "The Two-glass Test."

Some years ago in order to establish some standards whereby to judge the results of some clinical experimentations, Schofield

and the writer made use of a method for graphically charting the urine trends during the course of gonorrhea in much the same way as temperatures are charted. After thus recording the two-glass test in a number of clinic cases it became apparent that not only did the method furnish a record of events that could be seen at a glance, but it made it possible more easily to discover lack of co-operation upon the part of the patient. Within a few weeks of such studies much of the old confusion regarding the clinical course of the disease was banished and a far better understanding of what, before had seemed so contradictory was gained So true was this as to engender the conviction that in no other way could one more quickly familiarize himself with this disease than by going back over a number of old histories and graphically charting the urine trends. Such a plan is strongly recommended to those who wish to banish confusion and see things as they really are

Charts for the purpose are very easily made upon stock ¼ inch quadrille ruled paper by the use of a rubber stamp whereon the following urine pictures are properly spaced

Glasses	
1	2
Cloud	Blood
Cloud	Cloud
Cloud	Haze
Haze	Haze
Cloud	Clear
Haze	Clear
Shred	Clear
Clear	Clear

The spaces between the perpendicular lines of the paper each represent twenty four hours so that a dot placed at their inter section with the appropriate horizontal line makes the daily rec ord. The record can be made more complete by writing in the treatment cause of a change in urine trend or other things of interest along the horizontal lines as such things are written on hospital temperature charts

As one studies the accompanying charts together with those in the later chapters it becomes apparent that the first indication we have that Nature really and successfully is marshalling her

protective forces rests in a clearing of the urinary picture. So true is this that the mark of good treatment is except with astringents the speed with which it clears the urinary picture.

Perhaps the most characteristic thing in the course of gonorrhea is the definite trend toward latency that is shown by the ever present line of decline, the length of which varies with the treatment and the type of case Little observation is required to demonstrate the fact that, from the onset of this line of decline, *there is a progressive and continuous improvement in the disease* which, uninterrupted by avoidable influences leads on to cure. So true is this that from the moment the urinary picture begins to clear we can attribute with safety any sudden change in it for the worse to the treatment or the patient's conduct. Such being the case it will be seen that during this period, at least, we find in this method of charting the urine trends a ready and reliable way to judge of the efficacy of our therapeutic efforts as well as the influence of activity and of diet. As all of these matters are *fully considered under their appropriate headings it is needless to* enlarge upon them at this juncture

Viewing the question in its entirety the course of gonorrheal urethritis is far from the complicated thing we always have deemed it to be It is susceptible of division into two great types anterior and anteroposterior Each variety can differ in severity and each uninterfered with, will occasion a characteristic urinary picture up to the stage of complete latency Each picture can be changed for the worse by an assortment of ill advised and unfortunate events and most can be improved markedly by gentle local treatment. Each with or without treatments eventually will reach a stage of latency wherein there are no subjective or objective signs of the disease and during this stage the symptoms of the disease generally can be made to reappear with the greatest ease.

So greatly does charting of the urine trends during the course of gonorrhea narrow the field and so closely do these trends follow more or less fixed lines that it is possible to base upon them a number of rules that greatly aid us in our understanding of the subject. The more fixed and striking of these rules can be enumerated as follows

1 When charted the urine trends in the absence of trauma

in its broader sense show except at the onset of acute posterior urethritis and epididymitis practically horizontal lines or gradual declines

2 Once the line definitely declines toward the base line, it will continue to do so with but slight oscillation unless influenced by some preventable occurrence having a deleterious effect on the disease.

3 Except in the two conditions named, sharp rises or depressions of the charted line are not due to the disease per se

4 Any sharp rise in the declining stage is an evidence of misconduct on the part of the patient or overstrenuous treatment.

5 The rise due to a single mild untoward event, is usually of not more than three days duration. Great trauma, or repetitions of it may cause a continued higher level of the charted line

6 A higher level occurring shortly after the institution of another type of treatment and continuing so is evidence that the treatment is being roughly carried out, or the substance used is too strong for the given case

7 A sharp decline toward the base line except at the onset of acute epididymitis is to be attributed solely to the treatment used.

8 A sharp rise following a long period on the base line or just above it, that is not due to treatment, is due to a toxin response and is evidence that the gonococcus is still present.

9 A persistently high line in an untraumatized case is evidence of tardy development of resistance

10 An erratic line in the absence of overstrenuous treatment denotes bad conduct upon the patient s part.

11 A persisting high line without decline in a patient seen late in the disease generally means that his first doctor gave him a number of large injections of gonococcal vaccine

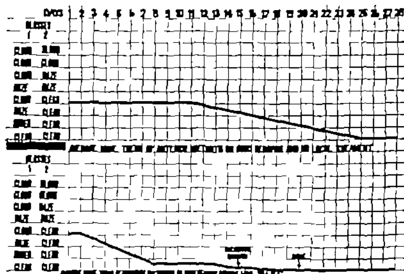
12 In the absence of astringent injections which render all urine studies useless a short horizontal line with a sharp line of decline toward the base line shows good treatment gently used and good conduct upon the part of the patient.

13 If the first glass of urine stays definitely cloudy for thirteen days or longer the posterior urethra practically always becomes infected

With these points in mind let us analyze some charts showing *the common and unusual trends of the urine picture during the* course of the disease

In the upper part of Chart I we see the urine trend of a well behaved patient who received no local treatment. It will be seen that, upon the first visit, the first glass of urine was cloudy and the second glass was clear, and that it remained in this state for eleven days. On the twelfth day it started to clear up very gradually and both glasses became entirely clear upon the twenty fifth day After that the two-glass test was of value only in show

CHART I



*ing the continued improvement of the patient. It was no sugges*tion of cure which probably was not the case for less than two or three weeks longer Such cases are rather unusual for untreated *gonorrhea rarely fails to extend into the posterior portion of the urethra.*

In this chart one notes a decided evenness of course without the occurrence *of untoward events of a nature that do so much* to make gonorrhea the erratic disease we so commonly think it to be. It also is to be noted that it exhibits the highly character istic long line of decline so common to gonorrhea in co-operative patients.

In the second part of Chart I is to be seen an entirely different urine trend as the result of daily gentle local treatments instituted in the first days of the disease. On the second day the urine trend started on a much more precipitous line of decline in that the first urine contained only some small flakes that could not be dignified by the term shreds by the eighth day of the disease. On the nights of the fourteenth and twentieth days there were involuntary seminal emissions. As is invariably the case, unless the seminal vesicles are infected these made no change in the urine trend nor did they retard the cure in the least. Such urine trends are ex

CHART II



tremely common in well-behaved patients treated locally by the method discussed later

In Chart II we see two cases similar to the first case on Chart I, except that both patients subjected themselves to influences causing a sharp but brief change in the usual line of decline. As previously was pointed out one or two such events during this stage rarely turn the disease course for the worse. At times, however they bring on immediate involvement of the posterior urethra. Such things, occurring while the urine picture is at its peak, almost invariably precipitate disease extension into the posterior urethra

In Chart III we note one of the extremely unusual things that have done so much to cause confusion, for, despite repeated untoward events *the infection still remained confined to the anterior urethra.* The patient's wife knew he had gonorrhea and where he got it. Her idea of punishment was to strip in his presence, carry out every suggestive contortion of which she could think

CHART III

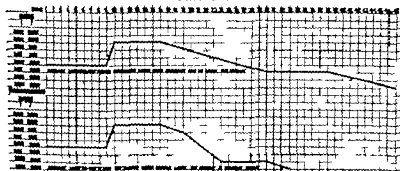
and dare him to touch her When she tired of this another disturbing factor entered. He ran a prohibition saloon" and every time some real beer made its appearance he could not resist the temptation of taking a generous sample. Between the two he failed to get rid of his gonococci up to the thirty-sixth day when he lapsed treatment.

CHART IV

Chart IV demonstrates that some patients go on to prompt cure despite much physical activity of a nature that usually prevents quick cure. The patient drove 100 miles on a motorcycle each day After the thirty-sixth day he rode across the continent on his motorcycle and no signs of infection could be discovered when he reached his destination That this is decidedly unusual is shown by the fact that one very rarely sees gonorrhea run a short smooth course in those who take daily long rides in auto-

mobiles Almost invariably they have a posterior extension, no matter how careful may be the treatment they receive Just why this should be is hard to understand for certainly, comparatively few patients are greatly harmed by the physical activity to which they have been accustomed Usually the physical activity that turns the disease for the worse is an unusual one for the patient. The frequency with which those who do heavy lifting develop epididymitis would seem to discount this view Here however the trouble is not primarily the occupation itself but the full bladder that the patient had when he so forcibly raised his intra abdominal pressure

CHART V

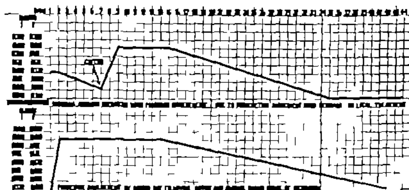


In Chart V appear two urine trends wherein the disease extended into the posterior urethra. The first depicts the average urine trend of a well-behaved patient who received no local treatment. In the second is evidenced the far shorter line of decline resulting from low-pressure intravesical irrigations with 1 8000 potassium permanganate solution In neither case were there any of the common untoward events that make pronounced changes in the urinary picture.

In the first case on Chart VI we see the urine trend of a dispensary patient who was receiving oral medication. There is noted an unusually early declining stage for such a patient. On the evening of the sixth day he put an end to this remarkable curative response by sexual intercourse. Posterior urethral extension was obvious on his visit three days later After that he behaved himself and by the sixteenth day his urine trend had started on a long line of decline which continued without interruption

In the second case on this chart is the urine trend of one of the so-called virulent infections. As the result of much sexual intercourse during his period of incubation, his disease immediately passed into the posterior urethra. Almost before he knew anything was wrong in his anterior urethra he had intense symp-

CHART VI



toms of posterior involvement. While such cases are by no means common they occur with sufficient frequency to confuse unless one takes a careful history More often such patients have a very profuse anterior urethral discharge for some days before the disease passes posteriorly Occasionally treatment prevents such disease extension.

CHART VII

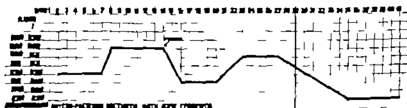


Chart VII is that of a patient with posterior urethral involvement who developed epididymitis on the fourteenth day It is usual in the beginning of this complication that the outpouring of pus decreases, so that the patient presents little or no urethral discharge This condition continues until the epididymal swell

CHART VIII

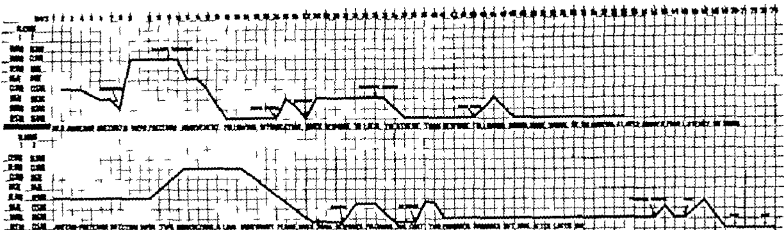


Chart VIII In the first case we see an individual with good resistive powers becoming intoxicated in the subsiding stage of an anterior *infection* and immediately developing posterior involvement. On the thirteenth day of his disease he received an intravesical irrigation of potassium permanganate. The response to this treatment was so prompt as almost to prove that his misconduct occasioned his posterior extension. On the twenty fourth day of the disease his physician unwisely passed a urethral sound and occasioned a marked toxin response When this subsided the patient was given 10 per cent argyrol injection. The change in the urine trend gives ample evidence that this solution was too strong, for discontinuing it caused a prompt clearing of the urine. On the forty fourth day the physician again tried a sound and caused a recrudescence of discharge After this both the patient and the physician behaved, and the former had a chance to get well.

In the second case we see an average anteroposterior curve with two later *toxin* responses *from* misconduct, and two much later ones *from* the first two prostatic strokings, but none after the subsequent ones.

(These histories were kindly loaned by an urologist who for obvious reasons, is not credited by name.)

ing starts to subside, when the discharge again appears The urine again clouds though usually not to the degree that formerly held, it remains so for some days and gradually clears. Commonly this second charted line of decline is more precipitous than is the case with patients who have not developed this complication

THIS tender subject has been so carefully handled throughout the years that one almost intuitively approaches it with caution. In all of the meetings of committees held to formulate programs for the prevention of the so-called "venereal diseases it has been passed by with scant and decidedly hesitant consideration. The fear of offending those who see it as the removal of one of greatest bars to immorality is everywhere apparent in their reports As Nelson and Crain have said of the committee to formulate recommendations for a Venereal Disease Control Program in State and Local Health Departments "They picked the subject up carefully between two fingers and dropped it into the lap of the United States Public Health Service The committee on the Public Health Control of Gonorrhea did little better The conference on Venereal Disease Control was a trifle more courageous in that it passed the following resolution "*Resolved* that the members of this section go on record as believing that the encouragement of prophylaxis should be an integral part of a venereal disease control program"

To those of us who see value in disease prevention this seems utterly foolish, but, when one sits down to deliberate upon things of a quasi-public character he must pay due respect to all shades of public opinion He would be foolish, indeed, to bring down upon much needed moves the loud condemnation of those high-minded individuals who fear that their children may be taught that sexual promiscuity can be made safe And let no one imagine that there are not millions who harbor this fear It came out in an avalanche of protest during the World War and even the greater public knowledge of these diseases today has not brought us to a point where we loudly can proclaim the fact that both gonorrhea and syphilis usually can be prevented in those who have exposed themselves That such is a fact is readily seen in the accompanying chart of the incidence of these diseases among members of the defensive arms of the service. The im-

provement therein shown was not due to a higher state of morals alone. Protective measures played by far the greater part.

Though, as physicians, we are interested in the question of morals, our major interest is in the prevention and cure of disease. And here is one field in which we can render great service. So true is this that each one should fit himself to carry out the needed preventive measures that fall within his domain, and he should do what he can to teach the erring ones how to escape infection For it is none too much in evidence that those who once have "worshipped at the shrine of Venus' are forever thereafter going

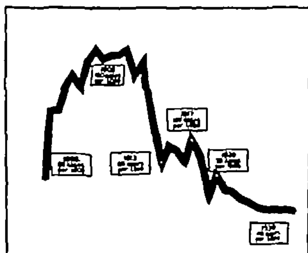


Fig. 43.—Results of a continued program in the United States Army—all forces.

to tread the straight and narrow path just because they fear that Venus may have been tampered with by others.

That many physicians either are not equipped to give chemical prophylaxis or are not willing to do so has been demonstrated to the writer by the experiences of some of his patients while in other cities. Some have been told to go to the druggist some others have curtly been refused prophylaxis and others have been told frankly that the doctor never carried it out and knew nothing about it.

Aside from avoidance of sex contacts it is probable that the condom offers the greatest measure of protection That infections

do occur in those who have used a condom during the sex act is to be attributed to several causes. All too often the condom is a faulty one. Frequently, contact has been made without the condom, which later is put on to avoid impregnation At times, material is gotten into the urethral meatus from the outside of the rubber as it is removed or is obtained from the unwashed scrotum

Much has been done of late years through pleas to the manufacturers of such rubber goods, so that a far smaller percentage of condoms are of inferior quality than formerly was the case The other faults only are to be overcome by education of the individual—an education that would do much to limit the spread of these diseases.

The enormous value of chemical prophylaxis is hardly to be disputed, despite the fact that many infections occur after their seemingly proper use by the individual. Considering the decided lack of manual dexterity of many men, the fact that many of these preparations offered for sale are stale and highly inefficient and the semi- or completely inebriated condition of their users, one should not expect perfect protection at all times. An approach to as near the ideal in this regard as is humanly possible demands that such measures be carried out with efficient bactericides by one skilled in their use. This brings the matter squarely to the physician's door and throws upon him a responsibility that he should not evade He will prevent many infections if he teaches his patients these things and urges them to visit a physician as early as possible if they have been exposed.

It has been shown that the value of chemical prophylaxis diminishes as time elapses. Carried out properly within two hours of exposure few infections will take place This, however does not mean that infections often cannot be prevented by prophylactic measures carried out within the first twenty four hours. It has been shown that the gonococcus does not find its way quickly into the epithelial interspaces As long as it is on the mucosal surface it can be killed by intra-urethrally injected chemicals.

The writer's method of carrying out chemical prophylaxis consists in having the patient urinate gently irrigating the anterior urethra with 1 8000 potassium permanganate solution and when this has drained out injecting 6 cc. of 10 per cent mild protein

silver (U S P) The latter is held in the urethra for five minutes and allowed to escape. The meatus and glans penis are dried and a 30 per cent calomel ointment is applied to the entire organ and some of it forced into the meatus. A cotton protective dressing is then applied held in position by two No. 10 rubber bands, and the patient is instructed not to remove it for an hour or more.

Strong protein silver (U S P) in 2 per cent solution is perhaps the best thing for patient use, and it should be followed by the application of 30 per cent calomel ointment. It is to be remembered that 2 per cent solutions of strong protein silver cause a decided purulent discharge for several hours after their use in most individuals, and it is well to avoid anxiety on the patient's part by apprizing him of this fact. For the patient's use, a ¼ ounce glass syringe with a rubber bulb is safest.

XV PATIENT CO-OPERATION AND HYGIENE

There is no disease in which progress toward cure is dependent upon the avoidance of so many seemingly trivial things as is the case with gonorrhea. So true is this that, in the past, it was the custom to warn the patient against many things that we now know were of no importance whatever Some of these older restrictions were so well known to the laity that it practically was impossible for the patient to give the full measure of co-operation demanded of him without rather widely advertising the fact that he had gonorrhea. Being unable to carry out all of the physician s admonitions he frequently used his own pleasure and judgment as to which ones if any he would follow and when patient pleasure and judgment is followed in this disease, treatment results seldom are such as to be conducive to great pride for the physician or overwhelming comfort for the patient.

It was only natural that this state of affairs should engender feelings of hopelessness in the physician s mind—a hopelessness that far too often interpreted itself in a looseness of patient instruction. Unfortunately one cannot gain good results from the treatment of this disease by such measures No matter how good and careful may be his treatment, the patient can nullify its value with the utmost ease Thus it is obvious that therapeutic results depend almost entirely upon what the patient does or does not do In other words, the physician is at the mercy of his patient today Not so many years ago the patient was at the mercy of his physician and as one views many of the older forms of treatment he cannot avoid the feeling that he often deserved far more mercy than was meted out to him.

To an enormous extent, as previously has been said the old hurtful plans of treatment have been discontinued. Ten years ago they so commonly were indulged in that the urologist spent much of his time in efforts to repair the damage that had been done by the treatment. Within the last decade this has changed so greatly that one seldom encounters a patient made immeasurably worse by the treatment received at the physician s hands.

To have made such changes as this in a single decade is one of Medicine's greatest gifts to mankind. If we had done no more than this it would be glory enough. But, fortunately, we have gone much further and, seemingly, are soaring to far greater heights in our battle against this disease.

No matter where the therapeutic trail may lead us tomorrow it is everywhere apparent today that so much of our success is dependent upon patient co-operation that we must not lose sight of the fact that he who reaches the greatest therapeutic heights is he who is the best salesman of good conduct upon the part of the patient. Not only must his initial salesmanship be good, but he must keep on selling during his entire contact with the given case. Never should he forget the common human trait of following the course of least resistance. Little children are taught by means of frequent repetitions of the same thing. Adults are but children of a larger stature. At least, most of those with gonorrhea seem to be. And he is wisest who does not assume too much intelligence for the most intelligent when they happen to have this disease. Our most successful advertising agencies win and hold their customers by constant repetition of the same thing. They do not fog the issue by variety. We even might appropriate one of their slogans that stared us in the face when we were children and still is good: 'Eventually, why not now?' The patient eventually must co-operate if he would be well and he just as well might do so from the start.

As elsewhere is stated, it is obvious that the introduction of sulfanilamide into the treatment of gonorrhea has not removed the need for patient avoidance of those things known to retard or prevent cure. Our poorest results from the use of this drug are obtained in our dispensaries where patient co-operation is at its lowest, and our best are gotten in bed patients where it is at its highest. *Were the results of this medication less immediate in* some patients this fact would be far more in evidence.

Thus, no matter what form of treatment is selected, there is imperative need that every effort be exerted to obtain a degree of patient understanding and interest that will limit, or entirely remove from the clinical picture those things that so successively

stay the therapeutic hand So important is this as to give great value to a separate consideration of each.

Diet—It now rather generally is believed that most of our former dietary restrictions were both foolish and needless. To-day hardly anyone seriously thinks that such things as fried foods, meats, fats, carbonated waters and the like have any influence one way or the other upon the course or curability of gonorrhea. Even the old restrictions regarding pepper mustard and like things have been discontinued by most thoughtful clinicians. Indeed, there is more reason to believe that urine containing the minute quantities of such things as would be present, would be favorably stimulating to the mucous membrane rather than the reverse As a matter of fact, most physicians feel that nourishment of the patient is too important for a needless tampering with his accustomed diet, and that enough has been done if they can keep him away from all things containing alcohol.

Alcohol—Just what the real action of alcohol is upon the curative processes against gonorrhea no one really knows We do know from centuries of clinical observation that hardly any patient s gonorrhea goes on to cure promptly and steadily if he consumes it. Not only is the consumption of alcohol the greatest of all causes of chronicity of infection, but it plays almost an equal rôle in the production of many of the complications of the disease So true are these things that there is no one thing of more importance to the patient and those with whom he comes in contact than the absolute avoidance of all alcoholic beverages By indulgence in them he not only prevents his own cure but he far too commonly transmits his infection to others during the mental states they induce when used in quantity

That the profession is none too generally convinced of these things is shown by the number of cases referred to the urologist because of long-standing infection Almost as a rule he finds that such patients have been indulging in alcohol, sexual excitement or both during almost the entire duration of the infection. The exceptions are those patients who have been given large doses of gonococcal vaccines or filtrates. Questioning of the patient almost invariably brings out the fact that he either has not been warned against the malign influence of alcohol on this infection

or the warning was given in an off-hand manner at his first visit and no more mention was made of it. Closer attention to this would deny the urologist of many much-needed consultations.

Sexual Excitement—Here, again, a little more general instruction to the patient would have its sad aspect for the urologist. And a little less of routine and more of the particular would pay immense dividends in disease prevention. It is not enough to tell the patient, as so often is done, "to keep away from women." To him that means do not have sexual intercourse, and nothing else. One does not have to have such intimate sex contacts to cause prolongation of this infection. Any form of sexual excitement will do the same thing. Just why this should be the case is not known, but that it is so is proved by an amount of clinical observation equal to that upon which our knowledge of the deleterious effect of alcohol in this disease is based.

Close observation soon will convince one that even minor degrees of sex excitation may influence the curative processes of patients profoundly. For instance it is only upon the rarest of occasions that a man who sleeps in the same bed with his wife during an attack of gonorrhea has his disease run a mild course progressing to prompt cure. Seemingly it makes little difference how little regard, sexual or otherwise, he has for his sleeping partner, the result is about the same so far as his gonorrhea is concerned. Upon too many occasions for counting the writer has changed the course of gonorrhea for the better simply by getting patients whose wives "meant nothing to them from the standpoint of sex" to sleep alone.

Even the reading of erotic literature or the witnessing of suggestive performances may be enough to prevent recovery in some patients. And some even are influenced by the occurrence of frequent sex dreams with or without emission. As a rule, however, involuntary emissions exercise no harmful influence except in the individual with gonorrheal seminal vesiculitis. This is an extremely fortunate circumstance, for the frequency of these and nocturnal penile erections is such as to prevent cure in many patients were they harmful.

From the foregoing it is obvious that one should go into the influence of all forms of sexual excitement with every patient in

a way that he understands thoroughly how much cure depends upon their avoidance

Ether and Alcohol Fumes —One who has tried to treat gonorrhea in hospital interns while on tonsil service and those individuals who work in alcohol fumes will have no doubt about the malign influences of both so far as this disease is concerned. Not only do patients subjected to these inhalations have a profuse discharge as long as exposed to them but they have a recurrence of such discharge each time they are exposed to them. By the same token, a patient with gonorrhea who for one reason or another is given ether anesthesia will have a severe recrudescence of symptoms shortly thereafter If he has had a moderately recent epididymitis he usually can be expected to have a recurrence of it within twenty four hours of the anesthetic.

Physical Activity —One cannot lay down such fixed rules regarding the influences of physical activity upon the course of gonorrhea in different individuals. In the main, it practically is safe to say that, with proper precautions the physical activity to which one is accustomed will not greatly retard his cure The fact that men in the heavy industries show a far higher percentage of epididymitis does not discount such a view altogether The mere precaution of keeping the bladder moderately empty usually will prevent this complication even in those who do heavy lifting.

There can be no doubt, however of the adverse influence of great physical activity in those who are not used to it. One who tried to treat gonorrhea during the World War in those who had just been started in military training could not have the least doubt of this. Never has the writer seen such seemingly virulent gonorrhea as occurred in new recruits stationed in Philadelphia at that time

Individuals who have sedentary occupations usually are made much worse by such things as golf long walks or any other prolonged physical exertion. For some reason long automobile rides have the same influence even in those who previously were accustomed to them So true is this that one seldom sees mild gonorrhea in those who ride long distances daily As a rule they have a profuse discharge for weeks after which they slowly drift into

a state of chronicity that scarcely anything seems to cure until they find a way to obtain a few weeks freedom from travel.

The writer sees no point in placing male patients with the possible exception of those who are to be given sulfanilamide in bed during the first two weeks of an attack of gonorrhea, as so often is urged Nor can he see a lack of wisdom in giving rather a wide latitude to the physical activity required by one's daily employment. If one properly educates his patients he will note little difference between the course of the disease in different

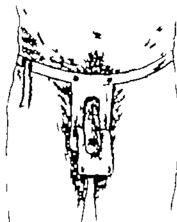


Fig. 44

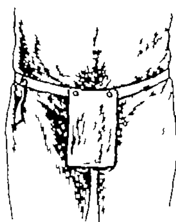


Fig. 45

Fig. 44 —Sanitary bag This is the most satisfactory penile dressing In the bottom of the pouch can be placed cotton or preferably gauze If sufficient of either is properly used drainage is not interfered with and the clothing is well protected.

Fig. 45.—Sanitary bag closed

groups. Usually the things attributed to occupation are due to other factors far more easily controlled.

During the florid stages of acute posterior urethral involvement there commonly is good reason to urge a definite curtailment in physical activity This is particularly true if one prescribes opiates for the relief of vesical intolerance to fluid, for patients relieved by this means are more prone to develop epididymitis upon slight increases of intra-abdominal pressure than are those whose bladders refuse to hold more than a small quantity of urine

Personal Hygiene.—As a preventative against eye infection, patients should be instructed to wash their hands with a good soap lather after handling the penis or its dressings. A knowledge that the gonococcus almost immediately is killed by strong soap solutions does much to remove the patient's idea of his own uncleanliness and makes him less fearful of his ordinary contacts with others. If added to this is the knowledge that drying also



Fig. 46



Fig. 47

Figs. 46, 47.—Old butterfly type of penile dressing. This dressing is not sufficient to prevent the soiling of the clothing where colored solutions have been injected into the urethra. It is a satisfactory dressing for the collection of urethral discharge, however.

kills the gonococcus he has only to be sure that any clothing that may have become contaminated is thoroughly dry before others handle it and he feels like less of a menace in his home.

Instructions should be given regarding penile dressings, to the end that types that do not impede urethral drainage be used. Perhaps the best type of dressing is that shown in Figs. 44 and 45. If the patient secures a roll of 2 inch gauze bandage he can

place a small portion of it in the depths of the bag and change it frequently at little trouble or expense. Gauze makes a far better drainage material than does the cotton the patient is so likely to buy if not told the difference. Such a dressing is better than the butterfly dressing for patients having any great amount of urethral discharge The latter dressing also is not applicable to the circumcised organ (Figs. 46 and 47)

Water Consumption —It does no harm for the patient to consume large quantities of fluids during the early stages of gonorrhea Just how much good it does is highly problematical During the acute posterior stage of the disease it can add greatly to his discomfort. His trigonal inflammation produces an intolerance to fluids in quantity and even on a small fluid intake, he is both busy and uncomfortable. On a high fluid intake he finds little time for anything but emptying his bladder

XVI. LOCAL MEDICATION OF THE URETHRA

So much of our present-day treatment of gonorrhea has to do with the application in one way or another of chemicals to the infected mucous membranes that it is highly important that we be familiar with the reactions of these membranes to various influences. One who has had much experience with the male urethra is sure to be struck by the fact that it has a mucous membrane that not only differs widely in its different expanses but differs from other mucous membranes in many particulars.

Aside from its obvious delicacy of structure it has a decidedly sensitive nervous mechanism It is poor in tactile and temperature sense and in most individuals has the habit of misinterpreting almost any direct stimulation as burning pain. Its true pain sense often is exaggerated beyond that common to most mucous surfaces and it interprets its pain as of a cutting tearing character It is more sensitive on its floor than on its roof and in its anterior than in its posterior segment, with the possible exception of the verumontanum in some individuals. This pain sense varies also from day to day for a strength of chemical that one day causes great burning pain may be borne with comfort on the following, and may cause greater pain than ever on the next day

Not only do the two portions of the urethra differ in their nervous interpretations, but they differ more markedly in their abilities to withstand chemical and instrumental trauma The anterior urethra usually will react violently to strengths of chemicals that can be used with impunity in the posterior portion of the canal One does not hesitate to use solutions of silver nitrate up to 50 per cent in the posterior urethra if need be, but he would be unwise to use even 2 per cent strength in the anterior urethra. Not only would it occasion great burning pain with extreme burning on urination but it would engender a profuse urethral discharge Further the use of 2 per cent silver nitrate or stronger to the mucous membrane of the anterior urethra is likely to produce so much deep mucosal infiltration as to encour

age stricture formation, whereas no such results follow behind the bulbomembranous junction.

The anterior urethra has the habit, not usually found in other mucous membranes of engendering an almost immediate purulent response to even mild irritation Not only is there an increase of mucus but countless polymorphonuclear leukocytes escape into the urethral lumen. So constant is this purulent response to urethral irritation that it offers quite a reliable indication of the strengths of chemicals that one safely can use. Clinical experience amply has justified the rule that anything that causes a marked purulent response lasting for a number of hours is too strong for the given urethra and is not good treatment for gonorrhea.

Some few individuals have mucous membranes in their anterior urethrae that are highly insensitive to pain and almost fail to respond with a purulent discharge upon even severe irritation Some quickly develop an urethral tolerance to chemicals and others become increasingly sensitive to them So common are these variations that it might be said with much truth that standards are lacking and that each individual must serve as his own standard

The posterior urethra is almost lacking in purulent response to the application of chemicals unless they be of a markedly caustic nature Even then it rather quickly recovers its normal condition usually without scar-tissue formation.

The trigone has a sensitiveness to pain much greater as a rule than that of the anterior urethra. This in consonance with its natural bent, it interprets as an intense desire to empty the bladder At times it is just a dull, burning sensation. It shows a ready purulent response One may use without discomfort to the patient a strong chemical in the posterior urethra, but one drop of even a 5 per cent silver nitrate solution on the trigone will *occasion great pain frequency of urination and marked vesical* tenesmus in many cases There is in this area little tendency toward scar-tissue formation

Practically all of our treatment of gonorrhea of these mucous surfaces has to do with the application of chemicals to them. When we turn to the consideration of just what these chemical contacts do to the mucous membrane we encounter an abyss of

ignorance We find that we know practically nothing of the biochemical changes they engender, that we have no more secure knowledge than the fact that clinical observation shows us that some of them have an influence for good. We encounter an almost untouched field for investigation

Unfortunately our ignorance is not confined to the action of these substances upon the membranes but it is about as deep regarding the biochemical changes brought about in them by the infection itself Perhaps when we known more about colloidal chemistry we shall be in a position to determine just what changes we are trying to overcome with our treatment. And when we know that, we shall be in a position to develop far better plans of local treatment than our empiricism has given us.

Until we have this knowledge, however we shall have to struggle along in our battle against this disease as best we can keeping in mind a number of little things that serve as guides and prevent us from courses of futile blundering. We shall have to respect the fact that recovery from gonorrhea is largely a mucous membrane process that the mucous membrane is struggling so hard in its battle that it is far from having the tolerance to insult enjoyed by it in its normal state and that we gain nothing and may lose much by trying it beyond its ability to carry on.

MEANS WHEREBY LOCAL TREATMENTS ARE APPLIED

An abundant clinical experience throughout the years has demonstrated the definite curative value of certain substances when applied directly to the infected expanses of the urethra. To carry out these procedures many different methods have been employed. Some of them were of such a traumatizing nature that they soon received just condemnation. Others not so obviously injurious lingered with us for many years often to the detriment of the patient and his disease Some that were ideal if properly used received much criticism from those who did not realize that the fault was with themselves and not with the procedure.

It repeatedly has been pointed out that the mucous membranes of this canal often strained to their utmost as the result of disease, are injured greatly by even the slightest trauma. When one realizes thoroughly the great part that drainage of minute mucous

channels plays in this disease he has little difficulty in understand ing how great a cure-retarding influence anything will have that increases the inflammatory reaction surrounding their small openings to the end that intermittent drainage is substituted for moderately free and constant drainage Thus, it readily can be under stood how there easily could arise a series of clinical observations among those who did not think through, that seemingly gave them ample foundation for criticism. Because of this, our two most valuable methods of local treatment, hand injections and irriga tions have been condemned by large numbers of physicians as procedures to be avoided in the treatment of this disease. Singularly enough, many of those who spoke most loudly against them substituted far more traumatic methods, such as catheters, Keyes-Ultzmann syringes and sounds And they then wondered why so many patients continued to have large numbers of shreds in their urines long after the gonococcus was gone.

Often, it was pointed out that patients who were treated by hand injections and irrigations developed more complications than did others. Assuredly such a statement merits the closest analysis. And as one analyzes it, he is sure to find that the difficulty was solely in the way they were used If one subjects the gonorrheal anterior urethra to fluid pressures that force the cut-off muscle he should not be surprised if practically all of his patients have a posterior disease extension. If he gives posterior urethral irriga tions under a hydrostatic pressure of 5 or 6 feet he should expect to have an extremely high incidence of epididymitis, and he should have no surprise over the numbers of those who de veloped abscesses of the urethral follicles and Cowper's glands. These things are to be expected under such circumstances Under other conditions these complications are rare in co-operative pa tients unless they have been advised to carry out the above procedures themselves without adequate instructions as to their dangers

Another reason why some have condemned the use of these methods is not altogether a complimentary one they are too much trouble Mankind always has struggled to find easy ways to do tedious things and it is no untruth to say that some of this

spirit has entered into the cause for the sweeping criticisms that some have aimed at these two means of local treatment.

Hand Injection.—In using hand injections for the treatment of the anterior urethra alone the question of urethral capacity is of the utmost importance. If one injects too much fluid it either must pass into the posterior urethra or escape alongside the syringe nozzle. And it takes very little syringe pressure to cause it to flow beyond the external sphincter. As has been stated elsewhere, the capacity of the urethra differs in different individuals, with an average at 10 cc. Thus to be safe, it is best to inject not more than 6 cc. This quantity, even in the more capacious canal, is brought by tissue pressure into contact with the entire mucosa between the external sphincter and the meatus. Beyond question this also occurs if only half of the quantity is injected, as is shown by the fact that the patient who uses a ⅛ ounce urethral syringe in his treatments does fully as well as

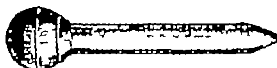


Fig. 48.—The safest type of syringe for urethral injections.

does he who uses a larger one. Also he cannot inject the fluid into his posterior urethra, nor can he apply a force that could in any way menace the drainage possibilities of his urethral follicles. To use or give to patients *syringes that hold more fluid* is to increase the number of untoward results.

In the application of medicaments to the anterior urethra it is highly important that the canal be cleansed by urination immediately before the treatment. There also is much to suggest that a better influence is obtained if this portion of the canal is cleansed further by being washed with some mild antiseptic, such as 1:8000 potassium permanganate.

By the use of a larger syringe, the physician will find it a simple matter to pass fluids into the posterior urethra and bladder. In doing so it is highly important that low fluid pressure be employed, if complications or injury are to be avoided. In order to promote sphincteric relaxation an effort should be made to elim-

inate the patient's natural fear reaction and to have him relax as though urinating. *As a matter of fact, it usually is easier to introduce* fluids into the bladder this way than by any other method. One does best not to use too large a syringe, however, as the greater the size of the syringe the less readily does the patient overcome his apprehension, as will be pointed out under the discussion of posterior irrigations.



Fig 49.—The safest and most convenient type of apparatus for urethral and intravesical hydrostatic irrigations.

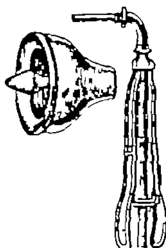


Fig 50.—Eaton urethral irrigating cut-off with the author's nonsplash nozzle.

Anterior Urethral Irrigations.—There is reason to believe that much good accrues at times as the result of copious irrigations of the anterior urethra. To carry these out without the danger of forcing fluids into the posterior portion of the canal, much care is required. There should not be more than 2½ feet of fluid

pressure and the urethra should not be subjected to this for more than a moment. The practice of working the nozzle in and out of the meatus rapidly as the fluid flows is not to be recommended. The fluid rarely flows out as rapidly as it flows in and the sphincter easily is forced. It is much better to place the second finger under the urethra to judge of its distention and immediately to remove the nozzle as soon as this occurs so that the urethra can empty before more fluid is allowed to flow into it. Skill in this is acquired very quickly

Posterior Irrigations—In order to carry out posterior urethral or intravesical irrigations with ease one must have a slightly

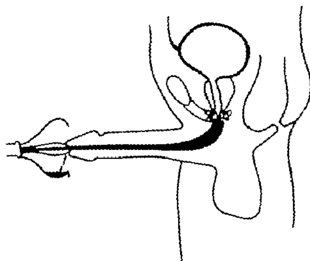


Fig. 51—Anterior urethral irrigation If the fluid pressure is kept low the tonic contraction of the cut-off muscle will prevent escape into the posterior urethra.

higher fluid pressure than is required for anterior irrigations. This should not be more than 3½ feet, however as there is definite danger in higher pressures for this purpose. One really should not force the sphincter but should encourage its relaxation. In order to do this the apprehension element must be removed by the assurance that it will not be painful. Apprehension in the patient is a very real thing in making it difficult or impossible to secure sphincteric relaxation. And the less fuss the physician makes about the matter the sooner he will succeed.

Another potent retarding influence is a large apparatus. Within reason the smaller the irrigating nozzle the fewer are the patients who are unable to bring about sphincteric relaxation on the first effort toward posterior irrigations. If one doubts this he only has to try it with a large nozzle and then a small one. Even urologic instruments in sight increase the physician's difficulties in this regard. Particularly is this so of Jewish patients For a long time the writer wondered why he had so much more trouble in one of his treatment rooms than in the others The answer proved to be a glass instrument cabinet in which an assortment

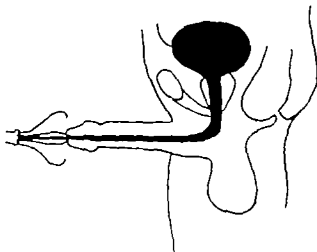


Fig. 52—Intravesical hydrostatic irrigation. Best carried out with a fluid pressure of not more than 3½ feet.

of urethral instruments were to be seen. When the cabinet was removed and a metal one put in its place the difficulty was over come

Intravesical irrigations may be carried out with the patient standing, sitting or lying down The first is by far the most con venient for the physician and it does not get the patient's thighs discolored if staining fluids are used The writer carries out his irrigations with the patient standing at a sink the top of which is 26 inches from the floor If such treatments are carried out on patients either in a standing or sitting position, it is extremely important to watch them closely during the first two treatments

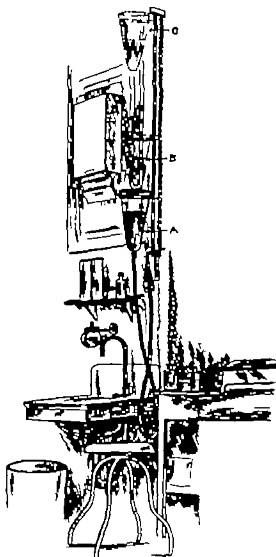


Fig. 53.—Author's treatment outfit. Patient stands in front of the basin, which is placed lower than the average basin height. A, Position of jar for anterior irrigations. B, Position of jar for posterior irrigations. C, Dangerous pressure for gonococcal urethritis.

and get them in a recumbent position at the first sign of oncoming faintness. Such reactions are by no means rare at the first treatment and they generally occur in the patient who boasts most

loudly that there is no danger of his fainting Sailors, for some reason, almost invariably perform in this way at the first irrigation One rarely has such troubles with later efforts.

Urethral Instrumentation —Probably the safest rule to make in the treatment of gonorrhea in the male is that no instrument of any kind soft or hard, should be introduced into the urethra while the gonococcus is present. Obviously the urethral mucous membranes are far too delicate to be thus insulted when they are acutely or even subacutely inflamed. And there is little to suggest that the canal is not harmed by such procedures when the inflammatory reaction has practically subsided The practice of passing sounds in the latter group of individuals is advised by some, but the writer can see only danger in it. As is elsewhere stated, most urethral strictures occur in individuals who have been treated in this manner One does the patient no kindness if he precipitates by urethral instrumentation the outpouring of round cells that later undergo a fibrous tissue change and narrow his urethral lumen He had better have his gonorrhea a little longer, if there is any curative value in such things than to run the chance of spending the rest of his life having a stricture dilated.

Endoscopic Treatment —In England and on the Continent it is far more common custom to treat gonorrhea by topical applications to the urethra through the endoscope than is the case here. In this country we have grown increasingly kind to the gonorrheal urethra—so kind, in fact that most thoughtful urologists are rather scathing in their criticism of such methods Of these the writer is perhaps more so He sees no call for such procedures in even the hands of the most skillful Some of the saddest urethral sequelae he has seen have resulted from this practice. To him the endoscope is definitely a postgonorrheal instrument and even then it is needed so rarely as to need no description of technic here

Keyes Ultzmann Syringe —In former days it was advised that the symptoms of acute posterior urethritis frequently could be allayed by the instillation into that part of the canal of a few drops of 1 or 2 per cent silver nitrate solution Some still carry out the procedure Here again, it is far better for the patient to have his symptoms a day or so longer than to spend the rest of

his life having a stricture dilated Certainly this procedure has no value commensurate with its danger

SUBSTANCES USED FOR LOCAL TREATMENT

Countless chemical preparations have been used for the local treatment of gonorrhea Almost all of them have been put forth as a vast improvement upon anything used before. Most have enjoyed a brief period of favor but few have remained in general use for any great period of time. As a rule these have been lauded for their supposed gonococcidal values, a quality that they largely lacked, though the lack of it was by no means the reason for their gradual journey to the realms of the rarely-used. There is no reason whatever to suspect that just because a substance may kill or retard the growth of the gonococcus in vitro it will, for that reason, exercise a curative effect upon the disease. In fact, our best results have come from the use of substances very feeble in such action and we have been even more successful with dilutions that further reduced these actions when present.

Probably in no other therapeutic field have we shown more gullibility than we have exhibited in so hungrily grasping each new substance. So true is this that one can predict with attractive accuracy the stages of rise and fall in advance Almost all of them have followed the same course. First there is a period of enthusiasm that must hearten those who manufacture the preparations There then follows a period of uncertainty preceding a period of virtual abandonment. One easily could mention a long list of things that have followed such a trajectory Hardly has one died before there is a "better one to take its place. This interesting cycle of events is worthy of some analysis, for there must be some hidden reason for it. Surely manufacturing chemists do not change the quality of their particular preparations at the peak of their popularity and give us from then on an inferior product. Not only has this cycle of events applied to those things used for local treatment, but it has been equally obvious in the course of those beautifully colored dyes for oral administration. Their chief purpose seems to have been to discolor under garments for surely they did not cure gonorrhea.

When we realize generally the reason for this enthusiasm as

a preliminary to deep disappointment we, perhaps, will not grasp so avidly for each new thing the detail man brings along as the "long-sought for answer to all of our woes." The reason is a very simple one and has to do more with the patients and ourselves than with the particular "new cure." It runs about this way When we become interested in some particular substance, our interest begets patient interest. Patient interest interprets itself into better patient conduct. His disease becomes milder and we attribute the change to the treatment. Being satisfied of its greater value we fail to show our early enthusiasm and, as we trend more and more to the routine we get less and less patient co-operation. As this wanes gonorrhea seems to be the same old disease and we desert our new found friend for a newer one so that we may get another disappointment

We would do far better for humanity if we realized that the storminess of gonorrhea generally bears a direct relation to patient behavior If there is little co-operation, no local treatment is efficient, for the patient counteracts every gain we make. If on the other hand we continually harp on the question of co-operation, most gentle local measures give an urge to curative response if they are not used too frequently There is little need to drift from one thing to another and there certainly is little need if any, to fill the coffers of the manufacturing chemists by employing things bearing copyrighted names when they have no advantage whatever in this disease over those that have been in the United States Pharmacopoeia for years

Largely we have narrowed ourselves down to potassium permanganate and strong and mild protein silver Years of experience should have taught us that these give the same types of mucosal response as do their far more costly brothers.

Neutral Acriflavine is still used by some though it largely has been abandoned by the majority of urologists Certainly it does not act the same with mucous membrances as do the foregoing and there is little to suggest that it exercises any great curative influence. Used in solutions of greater strength than 1 3000 it can cause great harm to the urethral mucosa. The writer once removed the distal 2 inches of a patient's urethra as though he were withdrawing a piece of rubber tubing In fact that is what

it at first was thought to be The patient had been given a 1 1000 solution of acriflavine to be used by hand injection four or five times a day Within three months after the removal of this urethral cast the urethra was almost occluded by scar-tissue contraction. At no time did his injections cause the least discomfort.

Potassium Permanganate is used in varying strengths for both hand injection, anterior urethral and intravesical irrigation. In the strength of 1 3000 it exercises a mucosal response equal to 5 per cent mild protein silver (U S P) Used in strength of 1 8000 to 1 5000 it is cleansing but only mildly stimulating. If used in greater strengths than 1 8000 as a wash preliminary to the introduction of mild or strong protein silver it causes the latter to produce a burning sensation far greater than when weaker solution are used.

Employed in 1 8000 solution as an intravesical irrigant it is of great value very frequently causing a marked change for the better in the second glass of voided urine. Often, its use in posterior urethritis that has reached a stationary stage turns the course of disease quickly toward cure

Mild Protein Silver (U S P) is in the writer's opinion far superior in its curative action in gonorrhea to any of the other highly advertised mild silver proteinates As with all substances used for the local treatment of the disease different strengths produce varying degrees of mucosal reaction in different individuals. It easily can be shown that 10 per cent solutions or stronger do not exercise a curative urge in most patients comparable with that obtained from the use of 5 per cent solutions. Upon rare occasions patients are encountered who experience too severe a reaction from even this strength solution and in whom a 3 per cent solution is more beneficial.

Strong Protein Silver (U S P) In 0.5 per cent solution produces a mucosal response analogous to that obtained from the use of 5 per cent mild protein silver As a rule 1.0 per cent solutions are too strong for frequent use and 0.25 per cent solutions are too weak to produce the maximum of benefit. Because of its lack of staining qualities strong protein silver is better for patient use

For use in prophylaxis the most appropriate strengths are 10 per cent for the mild protein silver and 2 per cent for the strong.

When used in these strengths they usually cause a decided purulent response about which the patient should be told if undue fright on his part is to be avoided.

Astringents exercise no curative value. They have a tendency to raise false hopes by hiding the symptoms while the disease is still present. They are best avoided in the treatment of this disease

Mercurochrome 220 if it is of any value in gonorrhea, is of so little that it can be dismissed from consideration

Silver Nitrate is far less frequently used than formerly was the case. It, however has definite value in some sluggish cases of anteroposterior infection often producing a prompt curative urge In strengths greater than 1 3000 it is too irritating The most usually employed strengths range from 1 10 000 to 1 5000 To avoid the staining of clothing it must be used with care. Such stains usually can be removed by the application to them of tincture of iodine and then removing the remaining discoloration with dilute ammonia water Stains due to mild protein silver, when fresh, can be removed with a solution of bichloride of mercury When old there usually is left a slight yellowish ring around the former stained area

XVII. THERAPEUTIC ORIENTATION

ONE who reads some of the glowing reports regarding the efficacy of sulfanilamide in the treatment of gonorrhea can be pardoned if the thought creeps into his mind that, at last, all of the drudgery in treatment has been removed and from here on there is nothing but pleasant sailing The statement that 90 per cent, or some such number have been cured promptly of gonorrhea by the use of this drug has such a thrilling, satisfying sound that the plights of those ten who did not get cured hardly enter his mind. Unless he is moderately old in the ways of gonorrhea and the waves of boundless enthusiasm that generally accompany the introduction of new forms of treatment, he is likely to think that all of his problems have been solved. One needs many such revelations before he realizes fully the truth of that old saying, "history repeats itself And, most assuredly she is repeating herself so far as sulfanilamide is concerned in the treatment of gonorrhea.

There is no doubt in the mind of any clinician, who has used this drug for the treatment of this disease that it is the greatest single therapeutic advance of all time so far as gonorrhea is concerned. To see active infections and their complications fade into nothingness within a few days is more than the most optimistic of us ever expected to witness. And yet, that is just what happens—sometimes. He who expects it to occur in nine out of ten of his own cases however probably is due for a rather sad awakening.

It is the history of this disease that he who first tries a treatment sets a mark for success that but few of his followers ever reach. No one ever had so great a success with potassium permanganate as did Janet Corbus stands without a contender for his laurels with gonococcus filtrate Ballinger lacks a rival with his abortive method Corbus again, had the field with diathermy Boyd with acriflavine Anwyl Davies with gonococcal antitoxin Koll with albargin Demonchey with his superstrength

AMBULANT CASES

HOSPITALIZED PATIENTS

Fig 54

vaccines and almost a host of others could be named who have had their little day in the lead of those whose lot it is to plod

steadily onward Just why this should be is open to many sur mises that it has its unfortunate aspects is beyond question.

It likewise is the history of this disease that he who dares to raise a discordant note in the midst of high enthusiasm is often looked upon (for a while) with great disdain. It he sees among the beautiful highlights of the therapeutic picture a number of real shadows and mentions the fact, he often becomes one whose delight in life is supposed to be the taking of the beauty from the rose, a real obstructionist to the onward march of science It is only in the cold light of later reason that we more generally real ize that it is he who fails to sound a note of warning who does the lesser service.

One who studies Fig. 54 in which are shown the percentages of successful results obtained by different workers is forced to the conclusion that sulfanilamide is in no sense the specific for gonor rhea that arsphenamine is for syphilis or quinine for malaria. That it does cure many cases promptly is beyond question. That it removes the symptoms of others but not the gonococcus, is equally beyond debate. That it fails utterly of any curative in- fluence whatever in others is outstanding. The reasons why these percentages differ so widely in different cities and in different clinics in the same cities will always be a matter of wonder to both the specialist and the general practitioner To analyze these causes would be interesting but, in some cases decidedly hazard ous. Suffice it to reiterate that history has repeated itself

The misfortune of hyperenthusiasm regarding treatments for gonorrhea falls upon those countless practitioners who see but few cases of the disease and yet must treat it. It takes years of frequent contacts with this disease even to approach a real under standing of its many vagaries and it is not to be expected of those whose opportunities for such experience are limited that they can sit in mature judgment upon the real value of new forms of treatment. They and their patients by the nature of things, must rely upon others for this service And it requires little thinking through to conclude that the side of failure merits just a little more attention than does that of success One's real problem is not with the patient whose disease is cured with almost lightning like rapidity His great concern is with the patients who carry

gonococci after seeming cure and with those who are in no way improved by this most remarkable therapeutic agent. And just so much as he is dazzled by overstatements, is he lured away from the things that are so needful in those cases that remain a menace to society and to themselves. The clinical knowledge of the disease never a very fascinating study to most physicians is forgotten or laid aside while each tries to emulate or outdo the most successful. And, unfortunately, it is not always taken up where it was left off to the detriment of countless of the afflicted. Nowhere in the vastly improved and stimulated field of therapeutic endeavor can justification be found for the neglect or discarding of those means of local treatment that have stood us in such good stead throughout the years

It, therefore is just as necessary that one know these how to apply them and what to expect of them as it was in presulfanilamide days. Their need may be limited to fewer patients, but no one can tell in advance which those patients will be. That there will be many of them there is no denial and for them there are few therapeutic short-cuts of promise certainly none that are so generally and safely available

There are many urologists who for various reasons start local treatments at once in cases of acute anterior urethritis whether they give the patient sulfanilamide or not. Some insist that such a plan gives a higher percentage of prompt cures while others just as strongly express the belief that sulfanilamide does better in the absence of local treatment. Beyond a doubt, the question is by no means settled But there are those who feel that this and other questions are absolutely settled and that they owe it to the early case of gonorrhea not to trust too fully to sulfanilamide alone and lose the decided value of the first days of treatment for those *in whom it fails. To the writer this sounds like excellent reasoning* for he long has felt that local treatment started in the first few days of the disease is many times more valuable to the patient than is that begun after the sixth day In fact it is the one way in which to reduce greatly the extension of the disease into the posterior urethra It is rare, indeed to prevent such extension by local treatment if it is not applied before the sixth day after the appearance of symptoms

As one analyzes the decidedly contradictory reports upon the percentages of cures as the result of prolonged hyperthermia in acute gonorrhea in the male he is prone to wonder why such an easily standardized method could give such widely varying results in the hands of workers equally fitted for the task. When he begins to sense the enormity of the repeated ordeals through which such patients must pass for cure and the risks they run in the doing, he is likely to wonder if the time saved for some is worth it for the many Surely gonorrhea in the male bears no mortality comparable with that of prolonged hyperthermia. And when he hears such masters of the subject as Carpenter and Warren say that "The method should be reserved for the treatment of the graver complications of gonorrhea and those patients who have resisted cure by other less dangerous and trying therapeutic measures" he senses that he will spare his patients much and deny

CHART IX



them little if he follows the dictum of these two scientists. For seldom has the investigation of a treatment measure for this disease been more carefully sanely and honestly conducted and reported upon than has theirs. (See also page 364)

Even if prolonged hyperthermia were all that some have claimed it to be it is by no means a type of treatment that could be made freely available to more than a very small percentage of the infected. The personnel required for its proper use is such as to put it beyond the financial reach of the large majority of those who contract the disease. Thus as with sulfanilamide, we find limitations that *again throw us back upon our older methods* of treatment.

Our wanderings into the field of biologic preparations have done little to solve our problems. They more often have inflicted great harm upon our patients in producing complications and

chronicity that otherwise would not have occurred. They have brought the writer to a position where he freely recants an older prediction to the effect that, "When the real answer to cure is found it is more likely to come from the laboratory than from the chemist." Seemingly the compass now points in the opposite direction

XVIII. SULFANILAMIDE AND ITS DERIVATIVES

During the last three years few things have received more attention than has the use of the sulfonamide drugs in the treatment of gonorrhea. When this present edition was written most of our knowledge was centered around sulfanilamide alone. We had tried a number of derivatives which either because of low therapeutic value or the production of too high a percentage of cases of peripheral neuritis were not passed by the Food and Drugs Administration and thus, are not on the market. We then had learned a little about sulfapyridine and the best of all of these derivatives, sulfathiazole had not yet made its appearance.

Careful investigation by a committee composed of members of the American Neisserian Medical Society and the staff of the United States Public Health Service[1] has done much to establish the real curative value of sulfanilamide itself That this work was needed can be readily seen by a study of Fig 54 wherein the cure rates reported by different writers varied from 28 per cent to 90 5 per cent in ambulatory cases The figure arrived at by this committee as the one most nearly giving the real truth was 50 per cent and there was needed much charitable interpretation to place it even that high In light of the cure rates obtainable by the use of either sulfapyridine and sulfathiazole it becomes obvious that sulfanilamide is by far the poorest drug in the treatment of this disease Not only does it give the lowest number of apparent cures but its use is followed by far more symptomatic relapses and asymptomatic carrier states than either of the others. Indeed, it is the fixed opinion of the above committee and many who have made the most careful studies of these drugs that sulfanilamide should not be used for the treatment of gonorrhea.

It is one thing to say that sulfanilamide should not be used for the treatment of gonorrhea and another to check its use entirely This is particularly true from an economic standpoint aside from the fact that drugs that once come into common use continue to be used despite scientific evidence that there are far

[1] J.A.M.A November 9 1940

better things available. The greater cost of both sulfapyridine and sulfathiazole, while it may not be a vital factor among the well-to-do, is a matter of much importance among the too-poor pay of dispensary practice. And, if great strides are to be made in the campaign for the control of gonorrhea it is a matter of paramount importance that the better drugs be made available to them at no cost or at most, one that is not prohibitive

In the mind of one who uses any of these drugs for the treatment of gonorrhea should be a number of highly important things that study and clinical experience have brought to light within the last few years Without an understanding of these things some of which are considered later in this chapter the physician is sure to fall short of the great aid these drugs can give and, *what is worse, he is sure to be the cause of a number of needless* transferences of infection to others. Unquestionably the outstanding thing that our experience with these drugs has brought out is their penchant for instituting totally asymptomatic carrier states. Of course there always have occurred small numbers of such individuals particularly among females but this number has been increased enormously among males where it was comparatively rare in presulfonamide days

It is perfectly true that most of these carrier states can be discovered by careful cultural studies carried out over a period of two months or more after all symptoms have disappeared But it is just as true that such prolonged probationary studies are not likely to be common occurrences in the very near future either in most offices or in most dispensaries There are of course several reasons aside from a possible lack of interest that reduce their likelihood The cost of such cultural studies, the difficulty of transporting material to the laboratory soon enough the lack of laboratory facilities and like things play an important part but the patient frequently plays even a more important rôle in that most of them will not lend themselves to such things for long after their symptoms have disappeared However it is the physician's duty to carry out as much postsymptomatic study as is possible and then no matter what *the findings to instruct the patient to* avoid unprotected sexual intercourse for some months thereafter as is elsewhere suggested

In presulfonamide days when a man transmitted the infection to his wife it was only necessary to wait a few days for her symptoms to appear to banish all doubts Since the institution of the sulfonamide drugs into the treatment of gonorrhea this picture has changed very materially for most, if not all of those women infected by men whose symptoms have been removed by the use of these drugs become absolutely asymptomatic gonococcus carriers from the start and usually remain so for many months In other words, they have not the slightest reason to suspect that infection has taken place. That it has can be easily proved by *repeated microscopic searches of the secretions of the cervix uteri* or Skene s glands for the gonococcus or culture of these secretions

Though these carriers themselves may remain asymptomatic, those to whom they transmit the disease are by no means so *They usually have the marked symptoms that so commonly* were viewed as infections by particularly virulent strains of gonococci.

The thoughtful physician who views this set of new conditions will naturally let his mind travel on to the question of pregnancy and childbirth and will see in them *a call for a higher level of* suspicion in his maternity work as well as need for the most careful ocular prophylaxis for the newborn

It is because of an early and repeated insistence upon these features of sulfonamide medication *for this disease that the writer* has gained the reputation in some quarters of being opposed to these drugs Nothing could be further from the truth. He feels that they should be used sensibly and if possible upon almost every case of the infection. But *being decidedly interested in the* reduction of infection and the protection of others he has cried loudly and long against the rather current belief that seeming cures are real cures. He has seen far too many tragedies and *near tragedies result from such foolish interpretations on the parts* of many who should have known better He has used these clinical observations to throw what commonly is called "the fear of God" into the souls of the easily convinced in about the same way as Dr Perrin Long and *others have used the need for blood* studies which comparatively few patients can afford. We have aimed at the same thing but in different ways though they have

been fortunate enough to escape the suspicion of being opposed to scientific advances.

Where such unfortunate clinical occurrences so easily can happen as is the case with these drugs in the treatment of gonor rhea, it is just as important that the physician be familiar with their shortcomings as it is that he see the glories of their action. One would have no need to worry about the case that really is cured provided he could determine the fact, nor need he be greatly deceived by the patients whose infections are in no way influenced by sulfonamide drugs. But the possibility of carrier states is a real hazard which should make us all pause and should urge upon us the necessity for the utmost care before we return any patients seemingly cured by these drugs back into social circulation And he who uses all of his talents in extolling the glories of any therapeutic achievement and fails to impressively exhibit its drawbacks is not doing Medicine an unalloyed service.

Toxic Reactions —From the combined reports of many work ers it is apparent that at least 50 per cent of the patients to whom sulfanilamide was administered in the comparatively large dosages generally used had one or several side-reactions directly attributable to the drug A small number of these reactions have resulted in fatalities, while by far the larger number though at times alarming have been of little apparent danger to the patient. Most of the reported fatalities have resulted from agranulocytosis and acute hemolytic anemia, while several have been caused by hepatitis.

Most of these toxic reactions disappear within a few days after the withdrawal of the drug Such, however is not true of the profound anemias, granulocytopenias and hepatic reactions, which require much time for a restoration to normal if the patient survives. Unfortunately there has been no way discovered by which one can single out those patients who are most likely to ex perience toxic influences from drugs of this type In many such reactions partake more of the nature of a drug idiosyncrasy hav ing no particular reference to the size of the dosage In others the incidence of such reactions bears a direct relation to the amount of drug administered. It is in the former decidedly ill defined group that such dangers lurk in a reinstitution of the

medication after it once has been discontinued because of its toxic effects.

The toxic reactions resulting from this drug have been classified differently by many writers. The best that the writer has seen is that of Dr Thomas Fitz Hugh and it is with his permission that it is reproduced here

1 *General* Malaise, faintness, vertigo, headache, tinnitus and lassitude. (Common but relatively trivial.)
2. *Central Nervous System* Mental confusion and optic neuritis. (Rare and apparently not productive of permanent damage, if recognized in time.)
3. *Gastro-intestinal* Nausea, vomiting, pyrosis, anorexia and abdominal pain. (Common and sometimes distressing, but not serious.)
4 *Hepatic* Acute hepatitis with jaundice and cholemia. (Rare but potentially serious.)
5 *Renal* Transient hematuria and albuminuria. (Rare and trivial, but if combined with hepatitis and azotemia this may become serious.)
6 *Cardiac and Circulatory* "Shock, precordial pain, anoxemia and fresh cardiac damage in predamaged hearts. (Rare and thus far not serious.)
7 *Cyanotic* Sometimes prompt, sometimes delayed and progressive. (Usually mild and common, rarely severe and serious.)
8. *Acidotic* Not as a rule of clinical importance.
9 *Cutaneous* Morbilliform, scarlatiniform, urticarial, vesicular and purpuric lesions (Variable and possibly increased by sun exposure, fairly common and not serious—sometimes delayed)
10. *Febrile* Irregular but usually pyrexia after a week of treatment. (Not very common and usually not serious except diagnostically)
11. *Anemic* Acute progressive hemolytic anemia. (Rare but potentially serious.) Also panmyelophthisic anemia. (Rare and serious.)
12 *Leukopenic* Delayed but rapidly developing agranulocytosis. (Rare and serious.)

In Table I can be seen the comparative frequency of many of these side-reactions as occurring among a series of *1625* cases of gonorrhea treated by Elliott and Silver and to whom is owed the privilege of its reproduction.

From such an array of possible toxic reactions it readily can be seen that sulfanilamide and its allied chemicals are in no sense things for haphazard administration. In fact, there are those notably Perrin Long who insist that sulfanilamide never should be given to patients not subjected to constant blood counts Most careful students of the subject insist that it should not be given to those who cannot be seen by the physician every forty-eight or seventy two hours. Such obviously justifiable positions put very

TABLE I

ANALYSIS OF SUBJECTIVE SIDE-REACTIONS WITH SULFANILAMIDE IN 1625 CASES OF GONORRHEA

Symptom.	Number of patients.	Percentage of patients.
Weakness	72	36 0
Dizziness	67	33 0
Dyspnea	60	30 0
Headache	33	16 5
Anorexia	32	16 0
Drunk feeling	25	12 5
Sleeplessness	22	11 0
General aching	19	9 5
Nausea	19	9 5
Cyanosis	19	9 5
Vomiting	9	4 5
Fever	8	4 0
Rash	11	6 5
Constipation	6	3 0
Diarrhea	2	1 0
Paresthesia	4	2 0
Temporary cycloplegia	1	0 5
Precordial pain	2	1 0
Temporary deafness	1	0 5
Urticaria	1	0 5
Toxic necrosis of liver	1	0 5
Peripheral neuritis	0	0 0
Hemolytic crisis	0	0 0
Agranulocytosis	0	0 0

definite limitations upon the use of this substance in ambulant patients who cannot always be closely followed. They make decidedly hazardous the prescribing of sulfanilamide tablets in large numbers to dispensary patients, upon whose co-operation little dependence is to be placed Indeed, after some distressing experiences with patients of this type, Johnson and Pepper expressed the view that it was far too dangerous for use among dispensary patients. The same opinion has been expressed by others as the result of equally unfortunate experiences.

In addition to the toxic symptoms given in Table I it seems that there are two of mild degree that belong more particularly to sulfathiazole A number of workers have described multiple swellings of the joints which easily could be mistaken for gonorrheal arthritis These swellings readily can be differentiated from true gonococcal arthritis by a discontinuance of medication as they disappear very promptly when the drug is withdrawn. Others have described the occurrence of conjunctivitis which also clears up promptly when the drug is excreted from the system Added to these is the opinion of some that mild skin rashes par

ticularly on the exposed surfaces, are seen more often than with the other sulfonamides With this view the writer's experiences are at variance, as he encountered a larger number of such eruptions while using sulfanilamide than since he turned to sulfathiazole.

Dose for dose it is evident that the toxic side reactions following sulfapyridine administration are about equal in number to those from sulfanilamide and that they do not differ in character So far as sulfathiazole is concerned the number of toxic reactions of moment is far lower than with the others. However present custom is to use much smaller doses of these two latter drugs than was, and still is, the custom with sulfanilamide. Thus, it is to be expected that on this lowered dosage there will be fewer toxic reactions from sulfapyridine and that those from sulfathiazole will be far less common. However it never should be forgotten that all of these drugs have dangerous possibilities for some patients no matter how small the dosage and that it is decidedly unsafe to prescribe them for patients who cannot be seen at proper intervals by the physician.

Blood Concentration—From the results of many studies by different investigators it is apparent that the question of blood concentration is by no means as important a one in the therapy of this infection as is the case with pneumonia and many others Indeed, it is questionable if blood concentration is of sufficient importance to justify the expense of such studies for those of limited means. The work of Van Slyke Thayer and Mahoney has shown that some of the most dismal treatment failures occurred in those patients whose blood concentration reached unusually high levels and that some of the most signal successes occurred where blood levels of the drug were exceedingly low Because of these things most clinicians limit such studies to their experimental work and pay no attention to the matter in their routine treatments unless toxic symptoms urge the wisdom of them

Dosage—As data have been accumulated it has been demonstrated that with these newer drugs at least, it is not necessary to employ the high dosages recommended for sulfanilamide Nor is it necessary to continue medication over so long a period as

originally was deemed necessary These changes in drug administration are fortunate ones for several important reasons. The lower dosage reduces the number and severity of the toxic reactions and that, with the shortened period of medication not only means that the drug is stopped before the late reactions are likely to occur but greatly reduces the cost of the drug per patient—a consideration of moment in dispensary practice and one that reduces the burden of health agencies that furnish these drugs from public funds

It is the consensus of opinion among those who have carried out the most careful clinical trials with these drugs that there is no point in their administration for longer than ten days. And there is equal agreement that the drug should be discontinued or another derivative instituted for the one being used if there is not an entire disappearance of symptoms by the end of the fifth day of medication. Various schemes of dosage have been used by different workers and those that follow have given their users about an equal number of apparent cures

Days	1	2	3	4	5	6	7	8	9	10
Grams	3	3	3	3	3	3	3			
Grams	4	3	3	3	2	2	2	2	2	2
Grams	3	3	3	2	2	2	2	2	2	2

As a general rule little is to be gained by repeat courses of the same sulfonamide after a full course has failed to produce a cure. *There are however exceptions to this rule as is the case with* almost every rule one lays down regarding gonorrhea, for it occasionally happens that a second course of perhaps slightly higher dosage started from four to seven days after the termination of the first does prove of benefit

One can find no suggestion in the later experiences of any careful students of the action of these drugs upon this disease that there is the slightest value in their prolonged use This was shown very conclusively by the previously mentioned studies of the Cooperative Clinical Group upon the use of sulfanilamide and there is no reason to think that exceptions need be made for either of the other derivatives. In this study all suggestion of benefit

from the drug disappeared after the second week and in most cases after the first week. After this cases on the drug did little better than did those on local treatment alone and after two months the results in those patients who were on local treatment alone from the beginning were better than with those who having had sulfanilamide and remaining uncured after the second week, were on local treatment alone thereafter The results upon those who received sulfanilamide at the beginning and concurrent local treatment, which also was continued after the cessation of medication were only slightly better than with those who had local treatment only

Clinical Responses.—It is obvious that the sulfonamide drugs do one of three things to the clinical course of gonorrhea—they either cure make the patient an asymptomatic gonococcus carrier or they utterly fail of beneficial action. If these drugs are exercising a beneficial action upon urethral gonorrhea it is first evidenced by a reduction in the amount of discharge and a clearing of the voided urine. In most favorable cases the discharge is entirely gone in forty-eight hours but occasionally there is the slightest amount of discharge even as late as the fourth day of medication If there are marked inflammatory symptoms in cases thus influenced they subside with great rapidity and are gone by the third day as a rule

Where these symptoms disappear and leave the patient in an uncured carrier state there may be a recrudescence of symptoms but, as a rule these do not occur even though the patient subject himself to repeated experiences such as practically always stirred smouldering infections to activity in presulfonamide days Indeed this asymptomatic carrier state may continue for many months.

In those patients whose symptoms are in no way influenced by these drugs the infection behaves in every way as though the drugs had not been employed Such patients respond to local treatments as did similar cases before we had these drugs and it is general impression that they have fewer complications than do patients whose sole treatment has been confined to local measures

Mahoney and others have held particularly with sulfanilamide that those patients who had been allowed to muster up some immunity response before the drug was started registered a higher

percentage of apparent cures than did those cases receiving the drugs within a few days of the appearance of symptoms. While this is of scientific interest, it would be a mistake to make extensive use of the idea in clinical practice The risk of the disappearance of patients from treatment before cure is far too great to justify a waiting policy for the sake of a slightly higher general cure rate. It is hardly good public health to increase the number of treatment defaulters by a waiting period.

When one considers that the average rate of disappearance from dispensary treatment before cure has been pronounced is around 76 per cent, it very readily can be seen that such a method should not be employed as a deliberate policy among ambulatory patients Mahoney's figures are based upon those patients presenting themselves for treatment late in the disease and upon hospitalized patients who were under control

It has been shown that patients who fail to respond following sulfanilamide administration commonly do so if placed on either of the other derivatives. But there is practically nothing to suggest that sulfanilamide does the same for failures upon the other drugs Some few sulfapyridine failures respond to sulfathiazole but there is little data suggesting that the reverse is true

Returning to the question of symptom disappearance it is obvious that the two-glass test in such cases does not hold the diagnostic value that it does in patients upon local treatment alone It has however the same negative value that it has in the asymptomatic stages of any gonorrhea in the male. It is in no sense a suggestion of cure as was shown by the previously mentioned committee's study wherein one out of three cases rendered symptom free by sulfanilamide and having a persistently clear urine for two weeks or longer still harbored the gonococcus As the asymptomatic carrier rates for both of the derivatives named is far lower than is that of the parent drug this source of error would be reduced of course but even that would not remove the need for the most careful microscopic and cultural studies as tests of cure

Apparent Cure Rates —The difficulty in the determination of cure has brought about the use of that somewhat evasive term, "apparent cure" which of course does not always mean cure

any more than the syphilologists equally evasive term "clinical cure' denotes true cure However, the term has some indicative value in experimental work and a study of late work makes it possible to place the comparative apparent cure rates at 30 per cent for sulfanilamide as against 80 per cent or better for both sulfapyridine and sulfathiazole Indeed some workers have re ported as high as 97 per cent apparent cure rate for these latter even in dispensary practice where all patients are ambulatory

That the term "apparent cure does not always mean cure is becoming increasingly apparent as time goes on. It also is be coming evident that a negative culture does not always signify that the patient is through with his gonorrhea. There have re turned to our dispensary anywhere from two to four months after dismissal because of negative cultures sulfathiazole treated pa tients with a gonorrheal discharge whose histories gave strong evidence of there having been no new infection. One almost in variably can get the sexual truth from male patients so that these cases could not be discounted as those of patients who had misled the physician. Some of them had had no sexual exposure and some gave too short an incubation period to support belief of a new infection. There of course have been patients who unquestionably had new infections but all of these had an incubation period of three days or longer whereas the discharge in the others appeared within two days of exposure.

In this regard the question has been raised about the possibility of these drugs bringing about a mucosal change that shortened the incubation period of a succeeding gonorrhea. From a number of observations the writer feels perfectly safe in stating that such is not the case nor does the administration of these drugs delay the appearance of what herein has been called a toxin response to liberated gonococcal toxins upon a sensitized urethral mucosa. Such toxin responses where they do appear take place well within twenty four hours of the event causing them as is the case with patients who have not been given these drugs

It thus can be seen what enormous possibilities for the con trol of this disease are now in our hands providing we can get patients under treatment and keep them there for at least ten days. Not that patients should be dismissed in so short a time

but that a large percentage of those who did default would be cured despite their disappearance from observation for the required probationary period. The fact that some would not be cured in that time and would infect others makes the ideal an entirely different matter and urges the necessity for patient education as well as a deep interest upon the part of his physician. It always has been a conceded fact that much of the gonorrhea in the past was here because of the sins of omission or commission of the medical profession. Here is the chance for us to shed a decidedly unattractive burden of responsibility for human misfortune.

The question as to the advisability of using local treatment in conjunction with the sulfonamide drugs is still an open one It has been shown that cases under sulfanilamide administration and local treatment registered a larger number of apparent cures than did those upon the drug alone And with so low an apparent cure rate as this particular drug shows it is wise to use the two together In this way one stimulates immunity responses in those destined to become drug failures and reduces the likelihood of complications.

Local treatment under such circumstances has one other point of definite value It is the observation of most workers of wide experience with this disease particularly in dispensary patients that local treatment has a marked case-holding value This is of considerable importance with a disease that registers so high a percentage of defaulting patients.

The actions of both sulfapyridine and sulfathiazole are so immediate where they do have a favorable action that there is little apparent need for local treatment unless it is for its case-holding value

One who studies conditions in our present dispensaries for the treatment of gonorrhea in the male is sure to be convinced that great changes are needed if we are to reap the disease control benefits that these drugs have made possible In most of our cities little has been done to raise dispensary standards above those that always have prevailed Surveys have shown that from 50 to 100 per cent of the patients who visited such dispensaries disappear before there was the least reason to suspect that cure

had taken place, and it is safe to predict that even today surveys would find the average lapse rate to be somewhere around 75 per cent in most cities

In few of our dispensaries are any real efforts made to change these unfortunate conditions. That they with little effort, can be greatly improved is easily demonstrated. In a survey of 7 dispensaries it was shown that the lapse rates ranged from 54.8 to 100 per cent and that the only reason for the difference was that some dispensaries paid a little more attention to patient education and feelings than did others If to this better treat ment of patients is added a follow-up service the lapse rate can be much further reduced. And if to this is added a real social service set-up wherein the patient's problems are considered and so far as possible solved these lapse rates can be reduced to around 10 or 15 per cent.

In office practice the lapse rates never reach such heights as the first named figures They however are much higher than most physicians realize. And their percentage bears a fixed relation to the efforts the physician makes to instruct his patients A realization upon the part of both groups of physicians of the enormous importance of the patient's first visit and action based upon such a realization would do much in the way of public health.

XIX. ORAL MEDICATION OTHER THAN SULFANILAMIDE

It is safe to say that other than sulfanilamide and perhaps its allied chemical compounds there as yet, has been discovered no substance which when taken orally exercises a curative effect upon gonorrhea. It, even, is almost generally conceded that nothing better can be said of the one that had the most devotees and that lingered with us longest—oil of sandalwood. That it does, at times reduce the urethral discharge and reduce the sensory symptoms is a fact. But it equally is a fact that the discharge usually returns when the oil is stopped and whether it returns or not, the gonococcus still holds the field Hence, oil of sandalwood has at last settled into its rightful place in the treatment, a giver of mental and sensory comfort to some few patients and not a cure Less and less often will it play its old rôle of a social menace by lulling the patient into a false belief of cure in the midst of communicable infection. Thus does God protect the women

The use of alkalis is still urged by some and of these sodium bicarbonate potassium acetate and potassium citrate are most commonly prescribed The argument for their employment was that they relieved the burning and irritation of urination. One could raise several clinical questions regarding this idea, however Alkaline urine more often causes burning on urination than does normally acid urine. Also burning on urination hardly ever amounts to much in gently treated well-behaved patients—seldom enough to require medication There are far more efficient things than urinary alkalinity for the control of this symptom. Mild tincture of opium or codeine is much more immediate and reliable

Sodium bromide in 15-grain doses or perhaps, small doses of one of the barbital preparations given before retiring often prevent annoying nocturnal erections and secure more restful sleep Calcreose in 20-grain doses at bedtime frequently relieves nocturnal vesical discomfort during the stage of trigonal involvement

and makes possible the comfortable retaining of larger quantities of urine. In 10-grain doses at three hour intervals during the day, it often adds much to the comfort of patients with posterior involvement and reduces the need for opiates. Tincture of hyoscyamus as an antispasmodic often adds to their comfort. So far as the writer's experiences and observations go little is to be expected from the oral use of the azo dyes beyond a beautiful orange-red urine and stained under-clothing.

XX. THE LOCAL TREATMENT OF ACUTE ANTERIOR URETHRITIS

In describing any type of treatment for this disease one should begin with the frequently pointed out need for patient enlightenment regarding the absolute necessity of his avoiding those things considered under the heading of, "Patient Co-operation and Hygiene. Without such co-operation local treatment and, often sulfanilamide are just so much wasted energy and medication. In giving such instruction it is a mistake to assume any high degree of either knowledge or intelligence on the patient's part, for this is one place where even the most brilliant of minds often fail to comprehend. Attention to such things is none too easily gained from a mind filled with the jumble of ideas born of the fact *he* has gonorrhea. Particularly is this true of married men whose minds are far too busy searching for acceptable alibis for home use to be capable of intelligently receiving new thoughts of another character Often it is best to aid with the alibis and get the matter finally settled before any efforts are made toward hygienic education The newspapers are said to rate general intelligence at about the general average of the twelve-year mind and there is a very definite advantage in keeping one's instructions to the patient at about that level.

The writer's usual method is to say nothing about the matter of hygiene until there is good reason to believe that the patient's mind has settled down to a point where it has good power of reception. A few simple questions directed to him usually will reveal whether or not his mental 'penetration time" is such as to bring a moderately prompt answer When this state of mind is reached the discourse runs about as follows "It would be well if you forgot all you think you know about gonorrhea and let me give you the facts as they really are. This is a disease caused by a germ that buries itself deep in the tissues, much out of reach of the things we use in its treatment. Typhoid fever pneumonia and most other germ diseases do the same thing If you had one

of these diseases you would know that it was necessary for you to form some substance in your body that overcame the infection or you would not get rid of it. In other words the real job of cure would depend upon your power to form these curative substances. Whatever treatment of one kind or another could do to help you to make these substances would be just so much in your favor but treatment could not make it unnecessary for you to produce them. In this regard gonorrhea is not in the least different from the others It is not what we do that cures you. That only helps you to form the things in your body that get rid of the germs. In other words getting well depends upon your tissues themselves. You do the real job and we only help you do it.

"There is one thing about gonorrhea however that does not apply so much to the other diseases Certain things that are commonly done not only will prevent you from building these substances that cure but will make you worse, and often, will cause serious complications that would not occur if you avoided them. The two most important of these are alcohol and sexual excitement. By alcohol is meant beer wine whiskey and anything that contains even a little alcohol. And by sexual excitement is meant not only sexual intercourse but anything that causes you to become even the least excited sexually That includes petting thinking sexually of women watching suggestive pictures or reading salacious literature Very few men who sleep with their wives go on to prompt cure Usually they have the disease for many months and often they have many complications For which reason you had better find an excuse now for sleeping alone.

"In some patients even strenuous exercise prevents cure and it is well to cut your physical exertions as much as possible. Long automobile rides seem to be particularly harmful, and most men who find it necessary to take them repeatedly have gonorrhea that runs a long stormy course. All of these things mean so much to your recovery that you had better understand what they are and stop them now if you have a desire to avoid a lot of trouble."

If the patient looks like one who by nature would be non co-operative he is told If you do not follow out these simple precautions I am not at all interested in treating you and would consider it a favor if you went elsewhere for your treatment My

interest is in curing your disease and not in getting your dollars." Such patients somehow or other get the idea that doctors will put up with anything so long as they get paid for it. Nothing jars them loose from such a view more quickly than being told to co-operate or go elsewhere. Usually, thereafter, they make excellent patients.

All patients are told that they can eat and drink what they please so long as there is no alcohol in any of it.

In the old days, when most of the treatments then in vogue were singularly unfitted for the florid stage of gonorrhea it was discovered that patients did better if local treatment was delayed until the symptoms of acuteness had subsided. This was perfectly true then as it would be today if the same things were used and done. But times and treatments have changed so greatly that the dictum, though it still is followed and taught by some, appropriately could be placed in a case alongside of the famed dodo bird. It certainly has little place in the modern local treatment of gonorrhea in the male.

For many years the writer has insisted that, if local treatments are not highly irritating in character, they should be started before the fifth day and if they are of that character they should not be started at all. In order to determine the efficacy of treatment started early and late he made a survey of 100 cases seen and on whom treatment was started before the sixth day of the disease in comparison with the cases seen during the same interval on the sixth day of the disease or later This latter number was 183 cases. Of the 100 cases appearing before the sixth day 14 had a posterior urethral involvement when first seen. Almost all of these had had much alcohol or sexual intercourse during their incubation periods. Six cases were nonco-operative in that they indulged in alcohol or sexual excitement during the course of treatment and developed a posterior infection.

Thus there were 80 patients that could be called good experimental animals for efforts toward the prevention of posterior urethral extension. Of these the disease was confined to the anterior urethra in 68 or 85 per cent, and extended to the posterior urethra in 12 or 15 per cent.

Of the 183 cases seen on the sixth day or later all but 14 had

a posterior infection when first seen and only 2 eventually escaped such a disease extension.

That the idea of a delay in local treatment because of florid symptoms largely has been abandoned by urologists is shown by the result of a questionnaire sent to the members of the American Neisserian Medical Society This showed them so overwhelmingly of the opinion that treatment should be started at the patient's first visit, regardless of the acuteness of his symptoms, that the Society at its 1938 meeting unanimously endorsed the procedure as well as a number of things regarding the treatment of the disease So important are these, that those having to do with anterior urethritis will be found at the end of the present chapter In fact, they are so much in accord with those put forth by the writer in the first edition of this book that the rest of this chapter will seem more like an elaboration of them.

As was stated in the previous editions, one is far better off if he knows one simple method of treatment and what to expect of it than if he has a sketchy knowledge of a number of different treatments. As a matter of fact, the underlying principles of all of them are about the same, in that they all aim at local tissue stimulation to the end that their curative efforts are stepped up, at the promotion of good drainage, for the same reason, and at the control of patient activities to the end that he does nothing to retard the development of his curative processes

So far as the chemicals commonly used for local treatment are concerned one safely can abandon the idea that their virtue depends upon their ability to kill the gonococcus. By the nature of things, they do not, in bactericidal values, come into close enough contact with the deeper-lying gonococci that, in reality are the ones perpetuating the disease. Whatever good they do must be from their cleansing value and their ability to create a favorable mucous membrane reaction. Unquestionably there is a host of chemicals that can do this. Some however seemingly do it better than others and it has become common custom among urologists to narrow themselves down to potassium permanganate and mild or strong protein silver Few of them feel the need for other things in the local treatment of this disease. Some few claim great value for acriflavine in solutions of 1 3000 or weaker but,

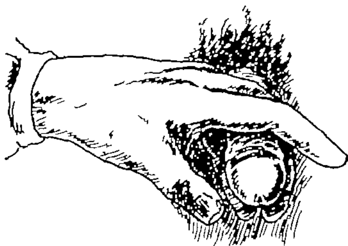


Fig. 55.—The shaft of the penis is firmly compressed between the middle and ring fingers until the distal portion of the anterior urethra is cleansed by the irrigating solution.



Fig. 56.—The compression of the middle and ring fingers is then released and the entire *anterior* urethra is irrigated

in the writer's hands, it has shown little to recommend it. In stronger solutions as has been stated elsewhere, it is devitalizing to the mucous membrane sometimes causing true necrosis of it, and without pain, if used too frequently In the weaker solutions it seems almost inert.

In the local treatment of gonorrhea two extremely important factors are worthy of careful consideration. It is a simple matter

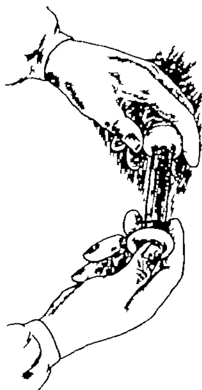


Fig. 57—Method of filling the anterior urethra with solution to be retained.

to prove that that strength of solution that causes mild urethral burning and a purulent response of but an hour or two in duration is far more efficacious than are solutions creating greater local responses It is equally simple to demonstrate that patients do far better on one or two treatments in the twenty four hours than they do on a greater number of treatments. The writer's method of procedure is as follows

1 The patient passes his urine in two glasses for inspection.

2 The anterior urethra is washed out thoroughly with 1 8000 potassium permanganate. In doing this the jar from which the fluid flows is never placed higher than 2½ feet above the urethral level.

3 The permanganate solution is allowed to drain from the urethra and, to be sure that the canal really empties itself, pressure is made with the finger on the bulbar portion of the urethra.

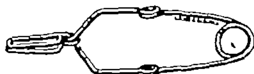


Fig 58.—Author's penis clamp.

4 Not more than 6 cc. of mild protein silver (U S P) is injected into the canal (The writer uses the commercial preparation known by the name of Silver Nucleinate and made by most manufacturing chemists.)

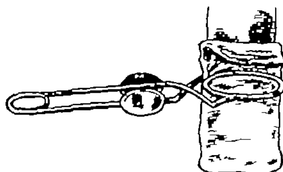


Fig 59 —Method of retaining solution in the urethra

5 A thickness of absorbent cotton and measuring 2 x 6 inches is placed over the end of the penis in such a way that it lies between that organ and the penis clamp (Fig 59) that holds it in place and the solution in the urethra.

6 The silver nucleinate is allowed to remain in the canal from five to ten minutes depending upon the amount of burning it produces. (Largely the amount of burning is controlled by the strength of the permanganate solution and if it is too great or

comes on too soon after the injection of the silver solution weaker permanganate solution is used at the next treatment.)

7 The silver nucleinate is allowed to drain from the urethra and a strip of cotton is placed on the penis and held there by two No 10 rubber bands for the protection of clothing (Fig 60)

8 Unless the patient is wearing a sanitary bag (Figs. 44 45) he is instructed to replace the cotton after the first urination, as some of the silver stain usually will remain in the urethra. He is told to take the cotton off at the second urination, wash the penis and not to replace the dressing as the constriction of the rubber bands prevents proper drainage. It is well to be sure that the patient understands this as, otherwise, he will appear for his next treatment with the rubber bands still on the penis.



Fig. 60.—Temporary cotton dressing held lightly by rubber band.

These *treatments are carried out* daily until such time as there is no urethral discharge and the first glass of urine shows only the very slightest haziness or some shreds. Usually this takes from ten days to two weeks. After this treatments are carried out at forty-eight hour intervals unless the discharge reappears when the daily treatments are resorted to for a few days. The longer-spaced treatments usually are followed for the succeeding two weeks and during the fifth week, the treatments are spaced at seventy-two hours. During the sixth week in the favorably responding cases the tests for cure are carried out and it is rare that they do not prove negative.

Patients who do not respond so quickly to treatments during the first week or two frequently are given treatment twice a day

for several days. If it is not possible to see them so often, they are given a ½-ounce glass syringe with a rubber bulb ejector and some 0.5 per cent strong silver protein, because of its lack of staining qualities. If seen in the morning they are told to inject a syringeful into the urethra and to hold it in exactly five minutes in the evening. Careful instruction is given as to how the injection is to be given and, if the patient does not seem to understand he *is made to give himself an injection at the time. If one prescribes* no larger syringe than a ½-ounce one he knows that the patient cannot force the solution into his posterior urethra.

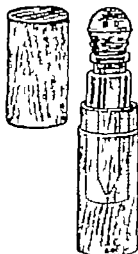


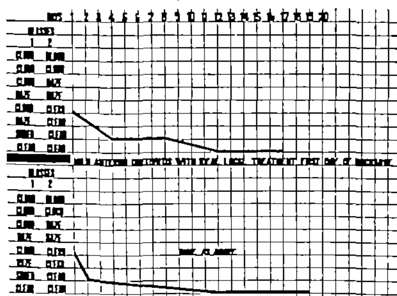
Fig. 61.—A convenient outfit for the patient's use.

During the entire time the patient is urged to study his voided urine in the office and constantly encouraged to continue his good behavior. Such patients do not become neurotic over their urine studies as frequently has been said. They know the truth about their infection and all of the fright element has been removed by utter frankness. It is only the uninformed patient, the one whose fears are allowed to run riot without efforts on the part of the physician to remove them who becomes what we term "neurotic." Nothing makes the gonorrheal patient more easy to handle than absolute honesty and frankness about his condition and its prognosis. The knowledge that he has practically a 100 per cent

chance of complete cure is what he needs most and fortunately it truthfully can be given him.

In cases where it is not possible to see the patient at other than widely spaced visits he is ordered to give himself an anterior urethral injection of the 0 5 per cent strong protein silver solution night and morning. And because one cannot make the repeated pleas for strict co-operation much more pains are taken to see that he is thoroughly impressed with the need for it. To be sure that he understands, he is asked to repeat these instruc

CHART X



tions. As should be expected, a far smaller percentage of such patients fail to have a posterior urethral involvement. They therefore, should be instructed as to the symptoms of posterior infection and told to visit the physician at once should they occur While it is usual to discontinue local treatment upon the appear ance of acute posterior urethritis, it can do no harm to the patient who uses a ½-ounce syringe if he continues his injections and often it tends to reduce the annoying urethral discharge.

Regarding the day-to-day prognosis of anterior urethral gonor rhea as depicted by the two-glass test, several things stand out

for several days. If it is not possible to see them so often, they are given a ¼-ounce glass syringe with a rubber bulb ejector and some 0.5 per cent strong silver protein, because of its lack of staining qualities. If seen in the morning, they are told to inject a syringeful into the urethra and to hold it in exactly five minutes in the evening. Careful instruction is given as to how the injection is to be given and if the patient does not seem to understand he is made to give himself an injection at the time. If one prescribes no larger syringe than a ¼-ounce one, he knows that the patient cannot force the solution into his posterior urethra

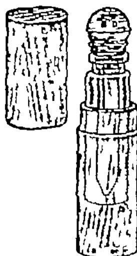


Fig 61 —A convenient outfit for the patient's use

During the entire time the patient is urged to study his voided urine in the office and constantly encouraged to continue his good behavior Such patients do not become neurotic over their urine studies as frequently has been said They know the truth about their infection and all of the fright element has been removed by utter frankness It is only the uninformed patient the one whose fears are allowed to run riot without efforts on the part of the physician to remove them who becomes what we term "neurotic." Nothing makes the gonorrheal patient more easy to handle than absolute honesty and frankness about his condition and its prognosis. The knowledge that he has practically a 100 per cent

tendencies with others more in keeping with pleasant contacts. He is not blaming every little thing on his physician and, in disgust, drifting onward to see what others have to offer The physician who accords to others those things that would mean so much to him were he the victim is the one who gets the best results and the most personal satisfaction from his contacts with gonorrheal patients.

So far nothing has been said in this section about the consumption of large quantities of water during the course of anterior urethritis. While the writer seldom urges it, he can see that it might be of advantage in some cases where the urethral discharge is profuse, in that the frequent urinations might relieve the urethral mucosa of much toxin irritation. In like cases there at times seems to be virtue in the taking of hot hip baths twice a day for not longer than twenty minutes at a time. The reason for this time limitation is that a number of cases have been seen whose gonorrhea for some reason, behaved quite badly following prolonged sitz baths. This is hardly in conformity with our present views of the value of heat in this disease but the clinical observation is by no means confined to an isolated case.

Recommendations of the American Neisserian Medical Society for the treatment of anterior urethritis (1938 Proceedings of the Society) follow

"1 Begin local treatment at once.

"2 Confine local treatment to the anterior urethra.

"3 Use irrigations of 1 10,000 to 1 5000 potassium permanganate, or hand injections of 5 to 10 per cent mild silver proteinate A hand injection may be preceded by an irrigation.

"4 Carry out treatment once or twice a day Do not use more than 2 drams of fluid for hand injections. The physician should carry out treatments whenever possible.

"If the patient cannot report for treatment at the proper intervals, give him a ⅛ to ¼-ounce blunt asepto syringe and instruct him in the proper method of its use and the necessity of stopping treatment and reporting to the physician if posterior symptoms appear

"Make every effort to secure patient cooperation.

Instruct him impressively regarding the dangers to himself and others and the necessity of avoiding alcohol sex excitement and excessive physical exertion.

"Advise patient that cure depends upon his own body processes, that treatment is aimed at stimulating these processes, and that results cannot be expected without his cooperation"

XXI. TESTS FOR THE CURE OF ANTERIOR URETHRITIS IN NONSULFANILAMIDE CASES

In outlining the tests for the cure of anterior urethritis a definite distinction should be made between those patients who have been treated by sulfanilamide administration and those whose treatment has not included the use of this substance. In the first group there are needed far more careful studies than need be indulged in for the latter group One safely may include in this latter group as well, those patients in whom such medication was stopped because of its toxic effect or lack of favorable action, after which the treatment was solely local in character For the individual in whom gonorrhea has not been influenced favorably by sulfanilamide in the first week, and in whom it has been discontinued by the end of that time shows no greater a tendency to become a symptomless gonococcus carrier than does the one who has not had this drug. Such, however cannot be said of those who seemingly have been cured by sulfanilamide. In them, one must add to our former tests of cure those studies outlined for such cases in the chapter on Diagnosis. Many of them, though symptom-free and still harboring the gonococcus fail to have the reaction to those disturbing influences upon which we have relied so greatly in our efforts to determine cure.

In order that it may not be necessary to keep continually mentioning sulfanilamide and nonsulfanilamide cases let it be understood that from here to the end of this chapter we are considering solely those cases included in Group II This group to repeat includes only those patients who have not been given sulfanilamide and those to whom it was given for not longer than the first week but in whom it failed to make any great change in the symptoms

In such cases the infection shows very definite characteristics which aid us greatly in our determinations of probable cure. In the male all of whose discharge comes from a small opening it is extremely rare that latent gonorrhea cannot be stirred by one means or another into a degree of activity wherein it is a reason-

ably simple matter to demonstrate the continued presence of the gonococcus It is true that mistakes are possible and it is for this reason that we call these methods "tests" rather than "proofs." Despite the many, to his mind rather poorly authenticated cases to the contrary, the writer is of the firm conviction that the gonococcus *cannot and does not reside in the urogenital tracts of those* in this group for any great length of time without giving unmistak able evidence that infection is present. It is not that kind of a disease. Even the marital 'gonococcus carrier" knows something is wrong with the tract. That he disregards its manifestations is no contradiction As previously was cited, not so long ago there was reported a case of the postoperative recurrence in a patient, while in the hospital of a gonorrhea that happened some decades before. During those decades there had been no symptoms in the patient or his wife and several children had been born and raised. Stahlmaker had a similar case, but being too wise in the ways of gonorrhea and humankind he examined the patient's nurse and found her gonorrheal. No record of such study is made in the above-mentioned recurrence that, without question appeared in a decidedly prominent place and was widely credited For many years the writer has searched among the 'innocent infections that have come under his care for a real recurrence of a remotely experienced gonorrhea with as much as six months freedom from all symptoms. As yet he has been unable to find a single case. Every time it was thought one was found later contacts with the patient developed the fact that he lied or had been infected recently by an erring wife or sweetheart. So fruitless a search for the weird and bizarre of this infection has led the writer to the conviction that there are no such birds to be found. Apparently some doctors are just a bit more easily fooled than are others.

Our tests are based upon the facts that latent gonorrhea is gonorrheal infection of the smaller mucous structures emptying into the urethra that the urethra is highly sensitive to the retained gonococcal products in these structures that it develops some degree of purulent discharge when these cavities or canals expel their contents and that there are a number of things that can and generally do cause this expulsion. Thus if after these procedures have been carried out carefully and upon several occasions it is

not possible by the most careful microscopic searches, to find the gonococcus in the sediment of the first glass of voided urine and the urethral smears, one is almost 100 per cent safe in assuming that his patient is free of gonococcal infection.

It, however, should be remembered that there is a decided difference between assumption and proof For which reason, it is a mistake to tell the patient he is cured It is far better to tell him that such efforts toward the determination are susceptible to error that he has responded negatively to all of the tests but, because of the slight possibility of error he should not touch his organ to the mucous membranes of another without the protection of a condom proved by forcible inflation to be a good one, for at least the next three months Of course, few patients will carry out such a precaution that long However one need have no worries about the patient who has had sexual intercourse on different days

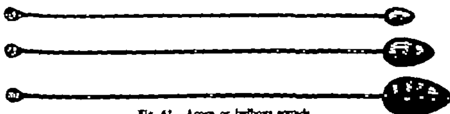


Fig. 61 —Acorn or bulbous sounds.

for three or four times without the slightest suggestion of urethral discharge. He has no infection to transmit if he fails to carry out such protection thereafter

Of the means whereby latent foci of infection can be stirred into activity, the most useful and commonly employed ones are the consumption of alcoholic drinks, sexual excitement (not intercourse at such a time) and the passage of instruments into the canal with massage of it over the instrument. Added to these should be massage of the prostate gland for in some few cases the disease passes into the posterior urethra without its occurrence being suspected by either the patient or his physician. Some physicians employ in addition to these methods the "provocative injection" of 2 per cent silver nitrate into the urethra. The great disadvantages of this are that in some patients who are cured there occurs a more or less prolonged discharge and that infections are

not revealed in this way that would escape detection by other means Large doses of either gonococcal vaccines or filtrates, likewise, have been used by some as a means of producing infective activity The faults with these are that they are usually not so effective as other things and that when a latent infection is stirred into activity in this way it usually takes a long, long time to bring about its cure

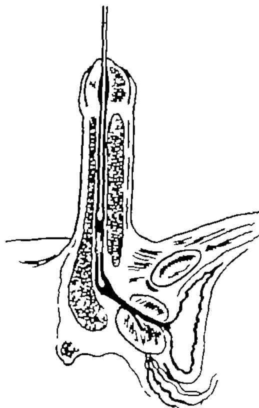


Fig 63—Urethral use of the bulbous sound to stir up any latent infection.

The writer's custom in carrying out tests for cure is as follows

1 They never are done until the patient has been entirely free from urethral discharge for at least three weeks and the sediment of the first glass of urine voided after vigorous digital stripping of the anterior urethra from the bulb to the meatus fails to show gonococci

2 A bulbar sound as large as will enter the meatus is passed

to but not through the external urethral sphincter This is drawn backward and forward through the canal several times and the patient is given glass slides and instructed how to spread any discharge that may appear

3 On the following day if no discharge has appeared, a regular urethral sound is passed to the bulbomembranous junction

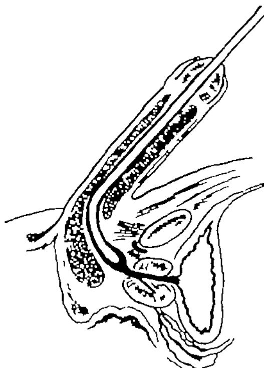


Fig. 64.—As final instrumental effort to reveal any hidden foci of infection a regular urethral sound is passed to *the bulbomembranous junction* and the canal is digitally massaged upon it

and the entire canal is massaged vigorously upon it. The patient again is instructed to obtain a spread of discharge if any appears.

4 The tests being so far negative, the patient is urged to drink a fair amount of alcoholic liquid to search carefully for urethral discharge to obtain a spread if any is present, and to bring in a small portion of the first urine voided the morning after the alcoholic indulgence. The sediment of this is searched carefully

5 If the findings are still negative, sexual excitement, but no intercourse, is allowed and the same procedure as noted in 4 is carried out.

6 The prostate is massaged and the washed sediment of its secretion, together with that of the first urine voided thereafter, are studied microscopically

If all of these fail to reveal evidence of lingering infection, the patient is told that he probably is cured and the precautions for the protection of others, as outlined above, are insisted upon. That these studies if carefully carried out, are safe, is shown by the fact that in the many thousands of cases upon which the writer has used them with negative results there has not been a single patient return with a recurrent infection.

XXII. TESTS FOR THE CURE OF THOSE ON SULFANILAMIDE MEDICATION

When one turns to a consideration of the tests for cure required for those who have been rendered entirely symptom free by the use of sulfanilamide, he finds himself on far less sure ground than he safely trod with those cases which here have been included in Group II The none too rare production of asymptomatic carrier states, the scarcity of gonococci their apparent change in morphology and the usual tendency for such patients though still infected, not to be stirred into a degree of disease activity productive of urethral discharge by the means so trustworthy with those comprising Group II inject feelings of deep uncertainty

Never has there been so much uncertainty regarding the question of cure in the male. Many patients in whom the older methods of cure are tried with negative results, indulge in sexual intercourse without the slightest recrudescence of symptoms usually they infect their partners and these women, as has been stated elsewhere usually have not the slightest reason to suspect infection until they have infected others.

Thus, there has arisen the absolute need for far more refined methods of revealing the gonococcus when present than ever existed even in the female In a measure this need has been supplied by the greater accuracy in cultural methods that has been developed in the last few years. Such refinements in culture, as has been said elsewhere have not come into such general use by bacteriologists throughout the country to make them universally available The general improvement needed along this line largely will await the demand for it Most assuredly the need for such a demand is upon us for it repeatedly has been shown that the percentage of positive cultures in supposed sulfanilamide cures far outnumbers the positives obtained by microscopic studies alone.

That little reliance can be placed upon serologic studies as now done is outstanding Their large and varying percentages of

false positives in nongonorrheal cases, the fact that they may give positive results for months after cure and the lack of uniformity in technic make them poor reeds upon which to lean, so far as tests of cure are concerned

With such a situation facing us it is obvious that not only is there an immediate call for much better use of the older things but an urgent need for the more general use of the newer ones, as well as the development of others of even more reliability Until these latter are found, we shall have to make more careful use of those we have. Not only should our seeming sulfanilamide cures be studied by those methods of microscopic study and the preparation of material for them previously described, but we should resort more freely to the greater assurance that carefully carried-out cultural studies afford. And when these have all failed to reveal the gonococcus we still should entertain a high degree of skepticism regarding cure. There should be urged for such patients at least a six weeks' probation period, including several patient doctor contacts, and we should insist strongly upon the use of a condom for far longer periods after the resumption of sexual intercourse Even then mistakes are sure to happen and transferences are sure to occur Foolish indeed is he who instills too much confidence in cure in the mind of such patients He will have much to regret.

Recommendations of the American Neisserian Medical Society upon tests of cure follow

"To be used only after there is no clinical evidence of the disease and the urethral and prostatic secretions and urinary sediments are negative.

"1 Urethral sounds.

"2 Consumption of alcoholic drinks

"3 Sexual excitement.

"4 Possible use of provocative urethral injections of 1 per cent silver nitrate

"5 Patient should be furnished with slides and instructed in method of making spreads of urethral discharge if there is any during these tests

6 Finding these tests negative it is best to advise the patient to use a condom during sexual intercourse during the next two

months and to report immediately to his physician if he sees the slightest urethral discharge

"7 If he has been taking sulfanilamide these tests should be carried out several times during the succeeding three months and, when possible, cultures should be made of the prostatic secretion and urine. The entire anterior urethra should be stripped digitally before securing these fluids for culture"

XXIII THE TREATMENT OF ACUTE POSTERIOR URETHRITIS

The extension of gonorrhea into the posterior urethra at once makes a change in the indications for treatment. The danger of precipitating complications by efforts at local treatments to the posterior structures when acutely inflamed is so great that it has been the custom of those of considerable experience with this disease to advise the discontinuance of local treatments until what might be called a subacute stage has been reached No matter how skilled one may be in giving injections and irrigations into the bladder he will find that, if he tries them during the disease stage under discussion the percentage of avoidable complications will reach an unfortunately high figure If on the other hand he limits his treatments during this stage to orally administered drugs and to hot hip baths and gives proper instructions to his patients he will find that these complications are decidedly unusual In other words the percentage of complications during the acutely active stages of posterior urethritis bears a direct relation to the type of local treatment applied and the behavior of the patient.

Upon the advent of posterior extension the physician finds that there is great need for further patient instruction to the ends that he be not too profoundly depressed mentally and that he gives even a better type of co-operation than he did before. Under careful treatment, the disease is just as curable as it was before and it is of great relief to the anxious patient if he is told so. Usually at this time, he is more concerned about his possibility for recovery than he is about just how long it will take. The knowledge that he still has that practically 100 per cent chance of complete cure is such a relief to him that he does not quibble about the time element

Because of the writer's conviction regarding the predominant cause of epididymitis being the forcing of germ-laden fluids into the ejaculatory duct and on to the epididymis through sudden

increases of intravesical pressure he instructs the patient as to the danger in about the following words "During the next week or two you will be in what might be called the most dangerous stage from the standpoint of the development of complications that are by no means pleasant to have The most common one that patients in this stage develop is what we call epididymitis. You probably would think it was a swollen testicle though the swelling really is in a structure attached to the testicle. This complication almost always is easily prevented if you will carry out with the greatest care the instructions given you. There is great reason to believe that epididymitis is due to the forcing of infected urine down through the small tube leading to the testicle. All you have to do to make it extremely unlikely that you will have it is to urinate when you have the desire and not try too hard to hold the urine longer If you have the desire to urinate while in bed get up and do so rather than wait. Avoid heavy lifting straining or anything that would increase the pressure upon any urine in your bladder *If you must lift or carry heavy things, empty your bladder first* You will not force urine into the canal if there is little or none in the bladder to force. Avoid sexual excitement as carefully as those things just mentioned and you are extremely unlikely to have any further complications than you now have"

It is by simple instructions to the patient like the above and the avoidance of local manipulations during the acute and early subacute stages of this phase of the disease that the occurrence of epididymitis in office practice can be limited almost entirely to those patients who have it at their first visit Certainly not more than 1 or 2 per cent of patients who follow instructions will have epididymitis, and in at least half of them the complication will occur through extension by continuity along the vas deferens. In them the swelling will come down the vas instead of starting in the epididymis and going upward.

While it is common custom for writers to urge the discontinuance of all local treatment during this time, it is not necessary to take this too literally What really is meant is that efforts should not be made to carry out intravesical treatments nor should the prostate gland be annoyed digitally There is no real danger

in carrying out anterior urethral treatments as advised in the preceding chapter Of course, these do not in any way influence the posterior infection. All they do is that they often control the commonly increased anterior urethral discharge and give the patient more comfort from the feeling that something active is being done to help him

One may question the second reason for such treatments and suspect that they are prompted largely by the economic return they give. The more he knows of the psychic processes of the gonorrheic, however, the less he will think such visits lacking in financial value to the patient. The writer seldom senses the necessity of it for patient peace of mind in his own practice At least 90 per cent of the cases he treats have been referred to him by other physicians. In order to refer a patient from one doctor to another one must give the doctor to whom the patient is referred an impressive and decidedly flattering build-up Thus, the patients appear with the conviction that they have arrived at journey's end, there is no further to go they have reached the feet of the oracle. And the supposed oracle can treat the patient daily until he reaches the stage of acute posterior involvement, give him a prescription and his instructions say See me in a week" and the patient bravely will do as he is told without fear or discontent.

For the general practitioner things are entirely different The patient knows that beyond him are the specialists. In fact, he frequently avoids them only because to him, they have a bad reputation for charging unreachable fees. One of the most valuable considerations in the treatment of this disease is frequent *doctor-patient contacts as the best means of keeping up patient* co-operation And it is not always safest for the patient to carry him along on daily treatments and then when he develops a disease extension that gives him real physical discomfort stop all ministrations, give him some further instructions and say "Come back in a week. Far too often, he goes elsewhere and fares far worse. Gonorrheal patients so commonly act like little children that one does not do well to assume too much for them. Thus, it often is the height of good judgment to carry out some simple utterly harmless and commonly helpful form of treatment during

this period than it is grandly to conclude that one has sold himself so thoroughly to the patient that he will toddle along and do everything he was told to do including his return at the appointed hour Many mortals are molded from material much too frail for such overwhelming confidence on the part of the physician.

Even though the patient originally may have been a sulfanilamide failure it is well to try the drug again during this stage if there are no definite contraindications to its use. At times, in such patients, it exercises the most dramatic of effects reducing the physical discomfort and clearing the urine as if by magic. More often, however the patient who orignally failed to improve as the result of such medication continues to do so.

The percentage of almost immediately favorable responses from this drug registered by patients first seen in the stage of acute posterior involvement but who previously have not been given sulfanilamide is even greater than that occurring in patients under such medication at the beginning of the infection.

During that period characterized by vesical discomfort and marked frequency of urination, it is best to reduce the patient's fluid intake and give him some type of oral medication aimed at making him more comfortable. For this purpose as has been pointed out elsewhere, such things as the mild camphorated tincture of opium in drachm doses, tincture of hyoscyamus in from 10- to 20-minim doses or perhaps codeine usually are efficient. In some patients the oral administration of calcreose in the dosage of 10 grains one-half hour after meals with 20-grain doses at bedtime will render the resort to opiates unnecessary Because of its lack of toxic qualities even larger doses of this substance can be used if needed

Added to oral medication or perhaps to avoid it, hot sitz baths or heat otherwise applied often are highly beneficial. Rest even to rest in bed is highly valuable Resort to prolonged hyperpyrexia should not be had without due consideration of its dangers.

It is not an altogether wise procedure in these cases to push sedatives to the point of complete bladder comfort. Nature seeing the danger of a full bladder in this stage of gonorrhea, arranged it so that the viscus could not retain its accustomed

quantity To obtund sensation completely is to invite epididymal infection

The recommendations of the American Neisserian Medical Society for the treatment of the active stages of posterior urethritis follow

"1 Stop local treatment until acute symptoms have subsided, give oral sedatives and hot hip baths.

"2 Urge the patient to rest as much as possible and avoid heavy physical exertion with any quantity of urine in his bladder

"3 Avoid the use of instruments while the gonococcus is present.

"4 Avoid prostatic and seminal vesicular manipulations until the first glass of urine is nearly clear and the second entirely so.

"5 When safe give gentle, hydrostatic intravesical irrigations of permanganate of potash.

"6 When prostatic manipulations seem safe start prostatic strokings of the gentlest sort and discontinue them if the patient is made even slightly worse.

"7 If prostatic strokings do not cause a recrudescence of discharge carry them out twice a week increase the pressure gradually until it is fairly firm and continue the massages until the prostatic secretion is free from pus."

XXIV THE TREATMENT OF SUBACUTE POSTERIOR URETHRITIS

Not a little judgment is required to determine when it is safe to proceed with those forms of local treatment that are aimed at the promotion of cure in the structures involved. It requires but a few mistakes in this regard to convince one that time often is gained by delaying them rather than plunging into them at the first moment they seem reasonably safe. Most certainly, they should not be begun until the patient entirely has regained vesical comfort. To carry out intravesical irrigations while the bladder still is intolerant to urine is to run grave risks of producing epididymitis by forcible bladder contractions alone.

Patients occasionally are seen who, though both glasses of urine become cloudy have no sensory discomforts at the onset of posterior involvement. This absence of discomfort often gives the physician the belief that it is perfectly safe to proceed at once with intravesical irrigations. At times such procedures are beneficial but, far more often they bring on an attack of acute vesical intolerance that is far worse than that so commonly seen in other patients during the acute stage of posterior infection. One experience of the kind usually is enough to stay the therapeutic hand thereafter in similar cases.

Usually it is best to withhold such things until the second glass of voided urine has become clear. This cannot be put forward as an invariable rule however as there occur cases in which there is no evidence of clearing of the second glass of urine for a long period of time, and yet in which a few intravesical irrigations result in its prompt clearing up.

It is not necessary to discuss the technic of such irrigations here as the matter has been covered fully in the section on "Means Whereby Local Treatments are Applied.

What one really is trying to do by the use of such irrigations is to stimulate mucous membranes to react against infection and to establish a degree of local tolerance to treatment that will hasten the time when it is safe to begin to treat the associated

prostatic infection. Most patients would slowly reach this stage if no irrigations were employed, but an ample clinical experience has shown that most of them do so more quickly if they are used

In the use of intravesical irrigations it is well worth repeating that they should not be given under a fluid pressure of greater *than 3½ feet and that the bladder should not be filled completely* To disregard these precautions precipitates many epididymal infections. They should not be irritating to the bladder mucous membranes if vesical spasm is to be avoided. The most efficacious thing for the purpose is potassium permanganate in 1 8000 solution.

It is well to carry out intravesical irrigations at about seventy two-hour intervals until such time as it is safe to begin digital treatments to the prostate gland and they should be discontinued if they create symptoms suggestive of harm Should there be any great amount of swelling of the prostate at this time its reduction often can be hastened by the use of rectal heat as advised in the paragraph bearing that title

XXV THE TREATMENT OF PATIENTS FIRST SEEN AFTER THE ACUTE STAGE OF THE DISEASE

It is the case with special practice, and probably is the case in general practice, that most patients with gonorrheal infections do not present themselves in the early days of the disease. Many have been under the treatment of other physicians some have taken a chance with the druggists, others have tried treating themselves and a few have had no treatment whatever And the physician finds himself faced with the problem of just where to begin

In such patients the first question needing an answer is whether or not the posterior urethra has been involved At times this can be determined by the patient s recital of the previous symptoms and treatment. In some, it quickly can be determined by the presence of pus in the second glass of voided urine. In the rest, it can be told only by the most careful of diagnostic studies. Often, however it is not wise to plunge too quickly into some of these for patients presenting themselves with few or no symptoms do not take it kindly if they are stirred into great disease activity by the doing of things that, though seemingly safe are in reality not so.

In many cases it is enough for one visit that a real diagnosis of gonorrhea is made without the physician having indulged in such things as prostatic massage Should there be a slight discharge or a slight haze in the first glass of urine with a clear second glass, one at least knows that there is an anterior urethritis. The question of possible posterior involvement safely can be delayed until another visit. At the second visit it might even be well to confine one's activity to the simpler and less dangerous means of infection localization. Upon occasions, one can settle the question of posterior involvement by thoroughly cleansing the anterior urethra before the patient urinates and then searching the first urine voided thereafter for pus from the posterior urethra. At a later visit the question usually can be settled permanently by a study of the expressed prostatic secretion.

Of course, not every patient who happens to have pus in his prostatic secretion has it there because his disease has gone into the posterior urethra. At least 35 per cent of all men have an excess of leukocytes in their prostatic secretions whether they have had gonorrhea or not. This urges the value of studying the washed prostatic secretions of those patients presenting themselves late in the disease. If the gonococcus is found in the prostatic secretion of a patient who has voided a good quantity of urine immediately before the gland is stripped, there can be little doubt regarding the presence of the disease posterior to the cut-off muscle.

From this point on there should be no difficulty in mapping out a plan of treatment best suited to the case in hand. If there is no posterior involvement, it is that of simple anterior urethral gonorrhea. If there is gonococcal infection of the prostate it is that appropriate to the stage present, as outlined in the previous chapter

In many cases seen late in the disease much of the urinary clouding is due to the epithelial desquamation of overtreatment. Thus, where many epithelial cells are present in the urethral discharge or the urinary sediment, the former treatment given the patient should be inquired into and, if it has been of a highly irritating character or has been continued over a long period of time one makes no mistake by making his early treatments to the canal of so mild a nature that they could not increase desquamation Often he does well to avoid the intra-urethral injection of chemicals for a few days and resort to oral medication It can be stated as a safe rule that the male patient who has a large number of epithelial cells in his urethral discharge either has had too much treatment or he has an old urethral stricture of small caliber The history answers the first and watching the patient urinate will leave little doubt about the second

While it frequently is wisest not to follow the patient's original plan of treatment too closely there is not always the need to abandon good treatment. Reducing the number of such treatments often makes a remarkable change within the first few days For instance a patient who has been using a perfectly proper strength of protein silver from four to six times a day usually has

far more urethral discharge than he would have if he used it only twice a day It is the nature of such things to cause a purulent response, and, under such frequent injections, another treatment is due before the response from the other has subsided.

In the patient having a stricture of small caliber one often is in a quandary as to whether he should treat the gonorrhea first or dilate the stricture. In such events the better course to follow is to treat the gonorrhea and dilate the stricture only when the disease is cured or a sufficient course of treatment has proved that it cannot be cured without dilatation. Most will go on to cure without dilatation, which can be left to a time when there is no gonorrhea present. Frequently one can dilate strictures in the presence of a gonococcal infection without precipitating metastatic complications. When such metastatic complications do occur however, they usually are severe ones, such as arthritis, endocarditis or gonococcemia. And patients should not needlessly be made to take such risks.

In all patients seen late in the disease it is well to remember that it has been the experience of most workers that sulfanilamide administered late in the infection registers a larger number of prompt cures than it does at the beginning of the disease. It, thus, is well to try this drug upon those who have not lately been taking it

XXVI. THE TREATMENT OF PROSTATIC INFECTION

It is not possible to determine just when it is safe to begin digital stripping of the prostate gland in each individual case following an attack of posterior urethritis. To do so too early or too energetically may produce much prostatic pathology, even abscess formation. More often such an error causes a marked recrudescence of local symptoms that subside only after some weeks of intravesical irrigations. Such being the case, one should approach *such treatments with the utmost respect for the harm that can be* done.

The first effort toward prostatic manipulation should be confined to only the gentlest pressure upon the gland. If this causes the slightest reaction, at least a week should be allowed to elapse before the procedure is repeated. Should there be no such reaction the second treatment, not earlier than three days after the first, should consist of several very gentle strokings of each lateral lobe of the prostate. Again, if this causes a reaction, at least a week should pass before the gland is touched. Lacking such a reaction the digital strokings of the gland may be continued at from three- to four-day intervals and the amount of pressure gradually can be increased at each subsequent treatment until a moderately firm pressure is reached.

Prior to such prostatic treatments it is well to carry out an intravesical irrigation, leaving some of the fluid in the bladder to be voided by the patient immediately after the prostatic strokings. In this way one usually can prevent the occurrence of an increase in urethral discharge, as the toxic products expressed from the gland are flushed out before they can exert an irritating influence upon the free urethral mucosa.

After about six weeks of prostatic massage, the technic of which is considered in the chapter of that title, it usually is safe to discontinue the intravesical irrigations. The patient should be instructed to visit his physician with a considerable quantity of

urine in his bladder, void a little for inspection before his prostatic treatment, and the balance immediately thereafter To continue the chemical irrigations during the entire time that is required to free the gland of pus very frequently means that at the end of the treatment, the patient still has many shreds in his urine and is disquieted thereby If, on the other hand the irrigations are not continued so long the shreds usually will have disappeared

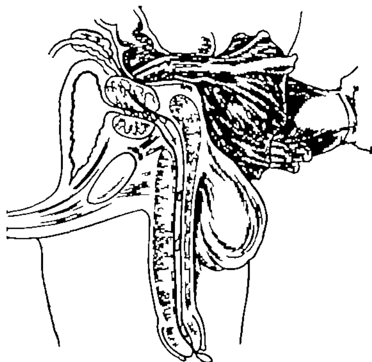


Fig. 65.—Method of obtaining the prostatic fluid for microscopic study Note the single glove finger with the cape for the protection of the hand. (After Legueu and Papin.)

by the time the patient is ready for dismissal. Many patients have heard so much about "gonorrheal shreds that they are prone to question the doctor's assurance of cure if they are present.

After four or five prostatic treatments have been carried out it almost invariably is safe to carry out the type of stripping that is required for the obtaining of the gland secretion for microscopic study A note then should be made of the number of leukocytes

present per high-power field and, from time to time, the study should be repeated as a check on progress

Patients progressing favorably show a gradual and continued reduction of the number of leukocytes as is shown in the chapter entitled "The Study of the Prostatic Secretion." And one should set as a standard of accomplishment a reduction to not more than 5 white cells per high-power field.

Under properly spaced and carefully done prostatic treatments it is rare, indeed, that this point is not reached in from two and one-half to three months. If progressive clearing of the secretion does not occur, one should turn his mind in other directions for the answer Many of these patients have had what has been called "focal infective prostatitis long before they contracted gonorrhea. Their prostatic secretions practically cannot be rendered and kept pus-free without attention to the primary foci to which the infection is secondary In over 95 per cent of such cases, this initial infection is in the oral cavity either as infected tonsils, infected tooth roots or poorly draining pus pockets beneath the gum margins. After these have been attended to it usually is possible to carry the prostate on to cure.

It should be remembered that tooth root infections only show in roentgenograms when they have caused enough bone change to make them visible For this reason, the teeth of those who still fail to progress toward cure should be restudied carefully for further evidences of infection. It is well, also to bear in mind that many dentists do not take gingival infections any too seriously and that it commonly is possible to get pus for microscopic study from the gum margins of those in whom dentists insist there is no evidence of trouble. Such pus pockets often are just as instrumental in perpetuating prostatic infections as are true root abscesses.

Tests for Cure—The tests for cure in patients who have had posterior urethral and prostatic infections do not differ greatly from those used for anterior urethritis It is well to pass a full sized sound to the bladder at the end of the course of treatment and the urethral secretion and prostatic and seminal fluids should be subjected to the most careful microscopic study by the methods described in the chapter upon Diagnosis

XXVII. CHRONIC GONORRHEA

In a consideration of chronic gonorrhea one must make some very close distinctions, for it has become the custom to include under this classification things that are not really gonorrhea. Many of the conditions that have lingered after the disappearance of the gonococcus have been considered thus. Some of these were due to infections by secondary bacteria upon a soil previously prepared by the gonococcus and some have had no relation to an antecedent gonorrhea Further, the term "chronic" has been given to many subacute and latent gonorrheas that were not in any sense chronic.

By making a generous allowance for what differences there may be in personal resistance or in gonococcal virulence, it is safe to say that, in the male, the gonococcus should have disappeared from the urethra and its adnexa well within six months of the acquisition of the disease. For this reason, let us consider as chronic those cases in which the gonococcus persists for six months or longer

Regarding the causes of such lengthy stays of the gonococcus in the male urogenital tract there is great difference of opinion. Much has been said in the past about the lack of personal resistance as a determining factor The more closely one studies this phase of the question the less he will think of it as a cause of chronicity In fact, the reactive powers of almost all individuals are so good that, in the absence of massive gonorrheal arthritis or the use of large doses of gonococcal vaccines, it is probable that lack of resistance is not the answer to the cause of chronicity in more than 1 in 200 cases. It is certainly a slender thread whereon to hang an excuse for failure to cure.

Unquestionably with careful, gentle treatment and proper co-operation upon the part of the patient chronic gonorrhea in the male almost entirely can be obliterated as a clinical entity It probably has less excuse for being than any common disease for few are more easily preventable That it is frequent and is

generally preventable, makes the subject well worthy of close scrutiny, for these are the cases whereby the disease so commonly is transmitted to others

The study of the causes of chronicity is an extremely fertile field wherein can be acquired that knowledge that often comes only after years of professional life as to what not to do If one will take the time to inquire of a number of patients with chronic gonorrhea found in any free dispensary just what was done to them and what they did during the first two months of their disease, he will find much food for thought. The uniformity of their answers is so striking that it quickly gives the key to the most common causes of chronicity

By making the most generous allowances for the influences of the patient's own acts, there will be found a composite picture that is none too attractive. For some forms of treatment that have been used are not so potent for cure as they are for the production of conditions that lead to chronicity

The most common things that will be brought out by such inquiries can be briefly enumerated as follows

1 The passage of instruments or solid bodies into the acutely inflamed urethra.

2 The use of injections and irrigations under very high pressure.

3 The use of substances in the urethra that cause great burning and a profound subsequent inflammatory reaction

4 The administration of large doses of vaccines or filtrates in the early stages of the disease

5 The entrusting of all of the treatment to the patient without adequate instructions

6 The use of intravesical irrigations when only the anterior urethra was infected

7 The use of silver nitrate instillations into the posterior urethra during the early stages of its acute inflammation

8 The use of astringent injections whereby the disease was rendered latent from the start.

9 Pronouncing the patient safe to indulge in coitus without doing more than looking at his urine to determine cure.

10 The use of prostatic massage so early that it could do only damage to the gland

11 Such strenuous prostatic massage that it caused the patient great pain

12 Prostatic massage under such conditions, and of such a type, as to favor extension to the seminal vesicles and epididymes.

13 Strenuous local treatments during an acute posterior urethritis.

14 Lack of knowledge that the prostate becomes infected in every case of posterior urethritis and does not recover spontaneously for many months.

15 The use of too many forms of treatment rather than the adequate use of one.

16 Failure properly to acquaint the patient with the dangers of the disease and the necessity for a strict mode of life.

If, for comparison, the inquiry is extended to the patients who experienced moderately short attacks of gonorrhea, and who present no gross postgonorrheal lesions the story will be very different. In this group of cases one soon will be struck by the fact that hardly any of them were the victims of too-meddlesome treatment. It will be found that they were well instructed as to the things they should not do and conscientiously followed these instructions. If they used hand injections they did it with real gentleness, and the reactions immediately following their use were so slight as to prove that the solutions were not so strong as to be highly irritating If the physician carried out local treatments they were not of a type that caused great pain and no instruments were passed into the urethra, or if they were, it was not done until very late in the course of the disease and it was done very gently

Among these cases a few will give a history suggesting only anterior urethritis, but by far the greater number will give a clear cut history of involvement of the posterior urethra also Of these latter many will have a chronic follicular prostatitis kept up by secondary invading germs on a soil previously prepared by the gonococcus. Those who do not have prostatitis usually will give a history of having had moderately gentle prostatic massage over a period of three months, or longer after their gonorrhea appar

ently had subsided. Not over 2 or 5 per cent will have had epid idymitis, whereas the first-mentioned ones who have had the 'too-meddlesome" treatment, will show an incidence of this complication ranging well up toward 25 per cent.

It would be satisfying if the differences in these groups could be blamed upon the varying degrees of resistance offered by the patient s own tissues. An explanation so consoling to the phys ician does not accord in any way with the writer's experience in this disease for he has found only a small number of patients who did not gradually develop the tissue response which we call "resistance.'

Such a comparative study of these two great groups of cases —those cured with reasonable quickness and those of long dura tion—again with the most generous allowances for the patient s own faults of conduct, is sure to engender the conviction that there commonly was something radically wrong with the treat ment. Nor is it hard to find what that something was

As chronic gonorrhea is really a disease of the smaller mucous channels in association with the urethra, and as these smaller structures obviously retain their infection because of their def initely poor drainage and not because of any difference in their mucosa, it is clear that no form of treatment that in any way can obstruct their outlets is good treatment. Without question, the passage of any solid body whether it be a sound instillating syringe or soft catheter over this delicate mucosa struggling for existence against this disease causes trauma and such practices do more harm than good. It is after such practices that many of *the saddest sequelae are seen.*

Upon this aspect of the subject it would be easy to write many chapters but, for brevity a number of "don'ts will serve the present purpose. Careful study brings out many 'don ts" that are of great importance if thoroughly preventable complications are to be avoided Let us then set down the most important

1 Don t do anything to devitalize this very delicate mucosa which must be relied on for cure

2 Don t injure it by the passage of solid bodies over it until there is reason to feel the gonococcus is gone

3 Don't use chemicals that cause a greater reaction than the membrane can stand.

4 Don t trust too much treatment to the patient, for he has usually less skill than the most unskillful physician.

5 Don t inject substances into the posterior urethra when only the anterior is infected.

6 Don't use a hydrostatic—or any other—pressure of more than 3½ feet of water The inflamed urethra cannot stand it without injury

7 Don't give large doses of gonococcal vaccine or filtrate in acute or any other gonococcal infection of the urogenital tract.

8 Don't think the bladder cannot be filled with 3½ feet of water pressure for it generally is easier to get the cut-off muscle to relax with slight than with great pressure. The latter irritates it and throws it into spasm.

9 Don't forget that posterior urethritis means prostatitis and that too early prostatic massage means permanent damage to the gland and possibly abscess formation.

10 Don t forget that unskillful prostatic massage, heavy lift ing, and sexual excitement or indulgence with a full bladder are the most common determining factors in epididymal involvement.

11 Don t fail to gain the patient s co-operation. Lack of it will render practically useless the most careful treatment.

12 Don t think a clear urine means cure for the gonococcus has a strong predisposition to colonize and lie dormant. It can be stirred to activity by any type of roughness, in those who have not been given sulfanilamide, and it is better that it be stirred by the physician than that the infection persist unperceived and perhaps be transmitted.

13 Don t forget that the utmost gentleness and judgment in the treatment of acute gonorrhea will obliterate chronic gonor rhea, and that the best ally is an untraumatized mucous membrane with good drainage.

Treatment —The treatment of chronic gonorrhea resolves it self into its prevention and the eradication of the deeper-lying foci of infection. If we remove these feeding foci the free urethral mucosa almost always will rid itself of the gonococcus. It is of little, if any use to treat the well-drained mucosa unless we

search for and cure the feeding areas in the smaller mucous channels Chronicity, in the absence of large doses of vaccines or faulty personal conduct, means poor drainage, and if we promote drainage we promote cure. Most patients with prolonged gonorrhea that are encountered today have had so many courses of sulfanilamide medication that it is useless to give them another

In approaching the cure of such long-standing infection, it is well to inquire carefully into the conduct of the patient and bend every effort toward its correction. As in acute gonorrhea the avoidance of sexual excitement and alcohol is of paramount importance, so in chronic infections cure cannot be obtained without the avoidance of both of these disturbing factors. If the patient can be made to deport himself so as not to interfere with cure the treatment of chronic infections as a rule, is not a difficult matter It is perhaps tedious but generally within the skill of every physician It requires patience gentleness and judgment. The more difficult intra urethral procedures are rarely required.

Mention has been made of the influences of large doses of gonococcal vaccines, or filtrates and massive joint infections upon the course of gonorrhea. These cases, so far as the local attack of the infection is concerned present a problem that differs little, if any from other chronic cases. Obviously in them extreme care should be taken as to any further experiments with gonococcal products Such patients are already suffering from a marked retardation of immunity processes from overwhelming amounts of gonococcal antigens

As the upper urinary tract and the bladder are practically never factors in the persistence of gonorrhea, we have but to consider locally those mucous channels emptying into the urethra distal to the vesical sphincter This limits us to such structures as the prostatic follicles, utricle seminal vesicles Cowper's glands, the smaller urethral follicles and such other factors as might interfere with urethral drainage such as stricture or a small external meatus.

It was pointed out, regarding the smaller urethral crypts, that they did one of three things when infected by the gonococcus. If permanently occluded they eventually sterilized themselves formed small round nodules of sclerosis and ceased to be factors

in the disease. If they were not occluded their drainage possibilities were generally sufficient for them to free themselves of the infection. If they were intermittently occluded, they could hold infection for long periods. Clinically it is evident that this intermittent occlusion in the male is such an uncommon event that it is seldom a factor in chronicity Owing to the difficulty of treating the smaller urethral crypts locally due to their minute caliber, this is a most fortunate circumstance

It is, *consequently a fact that in over 98 per cent of the cases* of chronic gonorrhea we have to consider only the other structures mentioned. There is further good fortune in the fact that at least 90 per cent of all cases of chronic gonorrhea are due to prolonged gonococcal colonization in the prostate gland, for of all of the causes underlying chronicity this is the most easily treated, and the most surely curable

The writer as has been stated elsewhere feels that the high percentage *of seminal vesicle infections by the gonococcus re*ported by some writers is much in error He has seen little clinical *and pathologic evidence to substantiate their claims, and finds* many reasons to believe that true gonorrheal seminal vesiculitis, even in cases with epididymitis does not occur in more than 2 per cent of the patients It should be thought of however and every effort made to prove that it does not exist.

Chronic infection of Cowper's glands does occasionally occur and, *if present, it will act as a feeding focus favoring* chronicity A very small urinary meatus is so easy of diagnosis that its rôle in the causation of chronic gonorrhea hardly calls for mention.

Stricture of the urethra is not so common as it used to be As a cause of chronicity it is at times a troublesome condition. However much one dislikes to pass instruments into a gonorrheal urethra, a *tight stricture, occasionally leaves little choice for* such a gonorrhea will not clear up at times until the urethral coarctation *has been fully dilated. An effort, however should be* made to clear up the infection before resorting to dilatation of the strictured area. Failing in this, the urethra should be irrigated carefully and gradual dilatation commenced. High intra urethral pressures from irrigating fluids should be avoided particularly

after instrumentation, as they may cause deep urethral infections requiring free surgical drainage.

As most of the treatment of chronic gonorrhea depends upon the removal of infection from structures that are discussed elsewhere, there is no need for repetition here Suffice it to say, that no case of chronic gonorrhea should be discharged as cured until it has had a final course of full dilatations with either a Kollmann dilator or sounds.

With gentle, judicious and persistent treatment, there is no need for the present degree of pessimism regarding the cure of these conditions. Cure cannot be accomplished quickly but it can be accomplished surely in practically every case. It often requires months of adherence to the plan of treatment appropriate to the given case Constant changes of treatment seldom accomplish the end sought.

In starting to treat chronic gonorrheal urethritis due to infections in any of the associated mucous channels in the posterior urethra, it is always well to carry out a series of intravesical irrigations under low hydrostatic pressure before too actively attacking the feeding focus. This is particularly wise in those cases showing any degree of activity for it produces a degree of local tolerance rendering other treatments moderately safe. If however the urethral discharge is very scanty the condition decidedly sluggish, little risk is incurred beyond that of an increased discharge by directly treating the deeper foci of infection.

There is no great point in giving too much thought to the urethra itself during the treatment of these foci for it will not recover permanently while they exist On the other hand it almost always progressively will clear up of its own accord as the causal foci improve

XXVIII. THE TECHNIC OF PROSTATIC MASSAGE

THE discomfort of, and the possibilities for harm involved in improper methods of prostatic massage make the consideration of the subject highly important. The older methods of carrying out this simple form of treatment were not planned with due regard to the anatomic structures and physiology of the parts, nor did they take into consideration the comfort of the patient. They were likely to be the direct cause of complications of considerable gravity and to make the treatment a thing to be dreaded and evaded by the patient.

Considering the question from an anatomic standpoint, it is evident that any form of massage that brings direct pressure upon the posterior urethra at each stroke is faulty The posterior urethra traverses the midline of the prostate, and at each extremity of it is a sphincter muscle The sphincter at the vesical outlet is much the weaker and each time direct pressure is made over the urethral line, any secretion forced into the urethra from the prostate will be forced in the direction of least resistance or back into the bladder From the number of cases of epididymitis following this form of massage, it is evident that the secretion at times is forced into the ejaculatory duct seminal vesicle and epididymis. Such being the case, it obviously is safer to perform prostatic strokings so that any expressed fluids are carried in their natural directions rather than forced back into the associated mucous structures. Fortunately massage thus carried out is a far more comfortable procedure for the patient. Direct pressure along the urethral line is the most painful part of prostatic manipulation and any form of massage that causes such pressure at each stroke is needlessly painful.

If we view the prostate from its rectal surface, we shall observe that on its upper border there is usually a notch lying between the upper poles of the lateral lobes. Extending beyond these lobes are the seminal vesicles whose ducts converge toward the mid or urethral, line to empty into the urethra. Between the seminal

vesicles are the dilated extremities of the vasa deferentia, the ampullae.

A study of the natural direction of flow in these mucous structures will, in itself, suggest that cross massage is an error (Fig. 66) Equally erroneous is that form of massage in which the finger is brought in a curved direction downward and inward to the urethral line.

Considering all things, and not least the comfort of the patient, it is seen easily that massage carried out in such a manner as to

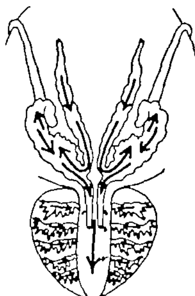


Fig 66.—Diagrammatic outline of the prostate gland, seminal vesicles, and ampullae to illustrate the normal directions of their fluids.

force the fluids in their normal direction and to bring about a minimum of urethral stroking, is both safest and most comfortable. This is done easily by passing the finger well up over the upper pole of a lateral lobe and bringing it down in a direction parallel to the midline By carrying the tip of the finger so that it presses slightly away from rather than toward the urethra the lateral lobe can be emptied well by three or four such strokes.

After both lateral lobes have been emptied in this manner the finger is passed well up beyond the median sulcus of the prostate and brought several times from there to the anterior extremity of

the gland (Fig 67) By this procedure any expressed pus that may have entered the ejaculatory duct openings is stripped from them into the posterior urethra and thence, past the cut-off muscle into the bulbar portion of the anterior urethra. From here it readily is obtained for microscopic study

The advantages of this form of prostatic massage are several. The dangers of such complications as seminal vesiculitis and epididymitis are greatly reduced. The expressed secretions are not

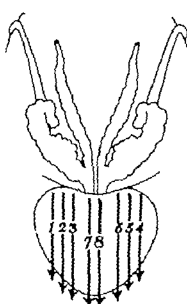


Fig. 67.—Direction of the stroking of the prostate gland. By leaving the midline strokes until last the discomfort is reduced to a minimum and is at the end of the treatment.

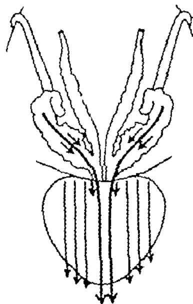


Fig 68.—Prostatic massage and stripping of the seminal vesicles.

forced back into the bladder but into the anterior urethra, reducing the number of so-called dry taps in obtaining them for study The discomfort to the patient is reduced to a minimum and what discomfort he feels is at the end of the process

Aside from the proper directions in which one should carry the finger tip there looms the important question of just how much pressure should be applied to the structures. In this with certain reservations, the patient s discomfort is perhaps the best

guide Massage that occasions great pain is too strenuous. In judging the amount of pain, however, one must discount the apparent evidences of pain that are merely an expression of the patient's apprehension, for it is the custom of some to make a great cry for fear they will be hurt. There is, however, a marked difference in the tolerance to prostatic massage exhibited by dif ferent patients. Likewise, an amount of pressure causing great pain upon the first massage will be easily borne after several treatments, as the gland becomes more and more tolerant. It is, therefore, wise to start with the gentlest stroking and gradually increase the pressure at later treatments as the prostatic tolerance increases

There are things regarding the pain sense of the prostate gland that, unless one bears them in mind, are likely to mislead him into faulty interpretations. Not only is the left side of the gland al most always more sensitive than the right, but most patients refer that of the right to the left side. If one asks which side the discomfort is on when the right side is being stroked most patients will say "the left.' Hardly ever is such a mistake made when the left side is being stroked. Thus it is not always wise to vision greater pathology on the left side just because the patient says it is more sensitive

XXIX. THE MICROSCOPIC STUDY OF FRESH PROSTATIC SECRETION

It is not possible to say that the prostate gland is free from infection by rectal palpation alone. Such a study may at times, determine the greater degrees of prostatic pathology but nothing short of a microscopic study of the glandular secretion can prove that there is no infection. Despite this obvious fact, many patients are pronounced free from the disease without resort to the microscope. This gland can be and commonly is reeking with infection when it is normal to palpation and the urine is macroscopically crystalline. To these hidden infections can be attributed most of the infections of women.

There is a *decided impression in the minds of many physicians* that prostatitis is essentially a postgonorrheal condition and does not exist if there has been no antecedent gonorrhea. Nothing could be more erroneous than this. It is true that the greater number are postgonorrheal in the sense that the gonococcus once having been present, has died out, and the inflammatory condition has been continued by secondary bacterial invaders upon a previously prepared mucosa. It also must be remembered that, while true gonorrheal prostatitis in the vast majority of these cases seems to be a self-limited disease there are those patients in whom the gonococcus remains in the absence of proper treatment for months On *the other hand, the association of prostatitis with* more distant foci of infection in the tonsils teeth, sinuses or gallbladder and in the absence of a previous gonococcal infection is far too common to be mere coincidence

The recognition of such infections does not of necessity belong alone to the specialist, and the technic of their study quickly could be *acquired by anyone having a fair knowledge of microscopy* While the more complete study of the prostate and its secretions consumes considerable time the most important question the presence of pus can be answered in a very few minutes The usual procedure is to place some of the fresh fluid upon a microscope slide and overlay it with a cover-glass for study The fresh

secretion of the normal prostate shows from two to six leukocytes to the 1/6 inch field, that of the abnormal exhibits almost any number above this, with a corresponding diminution of normal elements

The one constant and characteristic feature of all prostatic secretions is the presence of the so-called lecithin bodies or granules. Under the 1/6 inch objective these are small, round refractile bodies ranging in size from the minutest point almost

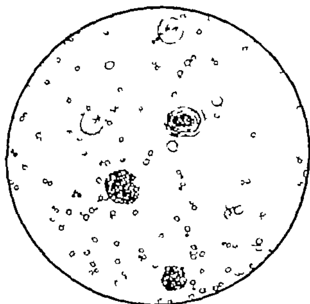


Fig. 69—The microscopic appearance of normal prostatic secretion. The laminated bodies are corpora amylacea. The other large cells are prostatic granule cells The next smaller are polymorphonuclear leukocytes in normal numbers. The remainder of the field is studded with lecithin bodies which are characteristic of this secretion

to the diameter of the red blood cell. They vary in numbers in different secretions and are greatly decreased in the presence of large numbers of pus cells. As the pus cells decrease in quantity the lecithin bodies increase So constant is this change that it has been used as a rough estimate of the number of pus cells present so that one might say that a given secretion contained 10 20 or more per cent of pus cells as the ratio between the two seemed to him without actual count.

In judging of the condition of a prostate from a secretion that seems to contain countless closely packed lecithin bodies and no pus cells it is well to exercise caution, for there is a common confusing factor in this regard. Wherever such a secretion is encountered it is best to make a second examination within the next few days to avoid error The chronically infected nondraining prostate has its ducts filled with quantities of granular débris the product of disintegrated purulent material. This is forced out at the first massage and cannot be differentiated microscopically

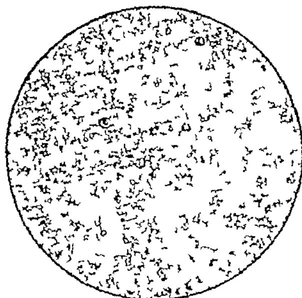


Fig. 70.—Prostatic secretion composed almost entirely of granular débris. A restudy within a few days generally reveals a large amount of pus.

from true lecithin bodies There may be no pus cells liberated but a subsequent massage expresses large numbers of them. Such a condition is by no means rare and always should be borne in mind, particularly where the prostate is being studied as a possible focus of infection for distant symptoms

It also should be remembered that in some individuals the entire gland may not be infected, and that a perfectly normal secretion may be obtained on the first few studies, because a deeper focus of suppuration was not emptied into the urethra.

The presence of more than six pus cells to the ¼-inch field means prostatic infection Free pus bespeaks fair drainage and clumped pus cells poor drainage. Improved drainage during the course of treatment is shown by the reduction in number and size of these clumps and their final disappearance

The presence of red blood cells in the expressed prostatic secretion is usually an evidence of urethral congestion or roughness in obtaining the secretion. It may however, be due to other

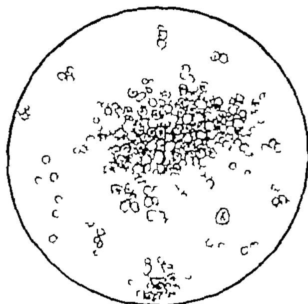


Fig 71.—Prostatic secretion of a poorly draining infected gland. The scarcity of lecithin bodies in such secretions is very striking As the leukocytes decrease in number these increase.

pathology such as urethral papilloma or ulceration. If due to congestion it generally disappears after the first few massages, but while it is present one does best not to massage over the urethral line.

The search of stained prostatic secretions for bacteria is not always so satisfactory as would be supposed. Not only are these secretions difficult to fix to the slide but they rarely give a picture with very clear definition when stained The entire field takes the stain to a varying degree and there are many round bodies of vary

ing sizes that are difficult to differentiate from the various cocci. As a rule the leukocytes stain poorly, and it is rare that one feels perfectly satisfied with his study of the leukocyte content of prostatic or seminal fluids by this method

A far better method is to collect the prostatic secretion in sterile distilled water shake it well, and throw down the bacterial and cellular content by the centrifuge as has been described in the chapter on Diagnosis.

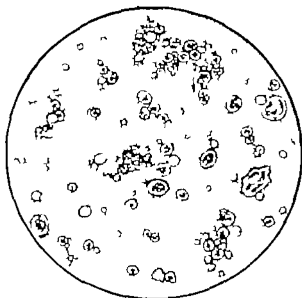


Fig. 72.—A prostatic secretion showing a slight tendency toward clumping of the leukocytes. Such a secretion is commonly seen and bespeaks poor prostatic drainage. It likewise is an intermediate picture evidencing improved drainage where previously there had been large clumps.

The culture of prostatic secretions, elsewhere described is usually a simple matter if certain precautions are carried out, but at best, there are factors of possible error The anterior urethra always contains bacteria which should be washed out by urination immediately before massage is carried out for cultural purposes. Obviously one cannot be sure that all of the surface bacteria are thus removed. On the other hand if he tries to irrigate the anterior urethra prior to massage, it matters not what his technic, he is almost sure to get in his culture air-borne spore-forming con-

The presence of more than six pus cells to the ⅙-inch field means prostatic infection Free pus bespeaks fair drainage, and clumped pus cells poor drainage. Improved drainage during the course of treatment is shown by the reduction in number and size of these clumps and their final disappearance.

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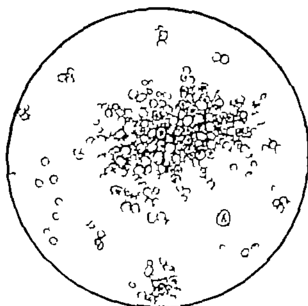


Fig 71 —Prostatic secretion of a poorly draining infected gland The scarcity of lecithin bodies in such secretions is very striking. As the leucocytes decrease in number these increase.

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XXX. DANGER ZONES IN PROSTATIC MASSAGE

OWING to the ease with which the diagnosis of prostatitis can be established, there has been, and still is, a good deal of rather indiscriminate prostatic treatment. Too little care has been taken in determining whether such treatments promised benefit or would be productive of harm to the patient. Discontinuing the local attack upon the gland when trouble had eventuated, instead of foreseeing such a possibility, has been instrumental in discrediting this extremely valuable procedure in many quarters and has been productive of complications of much gravity in not a few patients.

It never should be forgotten that prostatic massage is applied for the cure of disease that the tissue directly attacked is the seat of disease, that no such lesion in the body is best cured by roughness, and that this organ offers no exception. Our aim is threefold, and is reached only by gentleness. We desire to promote drainage in a poorly draining organ, to improve its circulation and to stimulate its musculature Bruising cannot accomplish any of these and may do great injury

The dividing line between the prostates that are benefited and those that are harmed by any kind of manipulative treatment is not always easy to determine. It is, however of the greatest importance that they be differentiated from one another The recognition of those that should not be massaged often taxes one's clinical judgment to its utmost doubts often arise and when they do a good rule to follow is, do not massage

There are certain groups in which doubts should not arise, and in which judgment should dictate the safest course. On the other hand certain borderline groups are apt to mislead, for which reason an effort will be made to discuss them briefly

The Acutely Inflamed Prostate—It seems hardly necessary to sound a note of warning against digitally disturbing such an organ, but it does not always escape attack. Such prostates are usually hot, swollen, throbbing and decidedly tender Their massage is a blunder that may cause abscess formation by break

ing down the barriers to infection that Nature is trying to form. Also it is conceivable that even greater damage could be done by causing a systemic invasion by the infecting organism.

The Tender Prostate.—Proper massage of the chronically inflamed prostate is uncomfortable but it is not acutely painful. The general rule can be made that the very tender prostate, if massaged at all, should be massaged with the utmost gentleness and care. It is a borderline gland which should arouse suspicion.

Under this heading might be included a type of infected prostate the diagnosis of which can be obtained only from the history, as it may be perfectly normal to palpation. The history of these patients is that suddenly, either with or without vesical discomfort, there appears a cloudy urine at times followed by an urethral discharge. The condition is apparently due to the rupture of small submucous pus pockets though there is seldom any acute pain. These patients commonly give no history of previous venereal disease and are usually free from gonococci. The seizures last several days and then subside. Recurrences are common. Palpation of these prostates shows nothing diagnostic, though there is often great tenderness if gentle pressure is made upon the midline in the region of the vesical outlet. While these prostates are loaded with pus massage should be withheld until the tenderness no longer is present and discontinued if it causes prolonged discomfort.

The Calculous Prostate.—The presence of calculi in the prostate usually is discovered by the transmission of a clicking or crepitating sensation to the finger. Calculi of varying sizes may, however, be present in the gland and not be discovered. This probably accounts for a small number of the prostates that are not improved by any form of treatment. Stones of any considerable size generally will cast an x ray shadow. Massage of these glands does no harm as a rule but it rarely does any good except where there are distinct symptoms of toxic absorption from the prostatic acini.

The Nodular Prostate.—Nodules of any kind in the prostatic substance should be viewed with great suspicion and massage withheld until they are proved not to be tuberculous or malignant. Theoretically interstitial inflammation of the prostate can cause

marked nodulation of the gland, and, from an academic viewpoint, such must be admitted to be the case but from a practical, clinical view this possibility had best be forgotten

It is not enough to consider that only hard nodules are tuberculous or malignant. The acute tuberculous focus is not hard, and in the markedly nodulated tuberculous prostate soft swellings may occur Massage of the tuberculous prostate usually is followed by marked activity in distant organs if not by a generalized miliary tuberculosis and death. Also massage is poor treatment for malignancy The proportion of such prostates that are subjected to massage is far greater than it should be.

The Nonresponding Prostate—Under this heading may be grouped that considerable number of patients in whom there seems to be clinically no contraindication to massage but who either grow worse or do not improve during the time it is carried out. It safely can be said that if the local symptoms of these patients are not improved or banished after six weeks of treatment, a pathologic condition exists other than follicular prostatitis. By this it is not to be inferred that one can render such glands free from pus in that time but that there should be a subsidence of the subjective and an improvement in the objective symptoms These patients should be given a careful cysto-urethroscopic study

In some of these nonresponding cases many very large prostatic openings are seen in the posterior urethra. Some of these are openings to old played-out abscess cavities whose walls are so rigid they cannot collapse These patients may be benefited by the occasional drainage afforded by massage but they rarely can be cured by the procedure McCarthy has attributed the large scarred prostatic openings to a played-out tuberculosis. In such cases massage is decidedly contraindicated by the possibility of reactivating dormant tuberculous foci. As a matter of fact, it would really be wise to precede massage in all chronic prostatic conditions by a cysto-urethroscopic study and thus avoid such unfortunate experiences

Prostatitis in Tuberculous Patients—Landis repeatedly insisted that a distinct hazard is entailed in the massaging of the prostate in patients known to have tuberculosis elsewhere in the

body He has seen 2 cases of acute miliary tuberculosis follow such treatment. Perhaps it is too sweeping to say that in tuberculous subjects prostates never should be massaged, but certainly there should be something more important than the presence of pus in the prostatic secretion to tempt one to resort to massage It is justifiable in such patients as present no evidence of prostatic tuberculosis, to carry out gentle prostatic strokings in the presence of chronic gonorrheal prostatitis, or where the definite systemic symptoms are proved to be due to the absorption from prostatic pus. Such manipulations should never be done for longer periods than are necessary to accomplish the object sought. The presence of nongonorrheal pus in their prostatic secretions should be disregarded.

The Fibroid and Hypertrophic Prostates.—The former are small and very dense to palpation, and are occasionally accompanied by referred pains in the penis perineum rectum or inguinal regions which is not relieved by massage. The latter are recognized by their size and consistency and accompanying vesical symptoms. In them, massage does neither good nor harm as a rule. Occasionally however it causes bleeding from commonly present varicosities, which bleeding may be profuse. The writer has seen several such cases wherein the bleeding was extremely difficult to check.

XXXI. THE CAUSES OF COMPLICATIONS

THE more closely one analyzes the events of patient conduct and therapeutic effort shortly antedating the onset of most of the complications of gonorrhea, the more convinced he will be that most of them are so easily preventable that they have little real need for being. A comparison of the occurrence of complications in dispensary patients in whom conduct faults are almost the rule with those appearing among office patients, in whom these factors are not so much in evidence, quickly gives one the key to the situation. It is not really necessary that such a study include dispensary patients for an analysis of those patients who present themselves to the physician late in the disease will show an incidence of complications far greater than will hold in other patients and, in fact, the same patients if the treatments are of a nontraumatic nature and proper efforts are made to obtain patient co-operation.

Thus it can be stated as a fact that the number of complications occurring in this disease bears a direct relation to faulty patient conduct and the traumatizing qualities of the treatments applied. From the standpoint of the prevention of complications alone there is every reason to extoll the great need for patient control and the avoidance of all forms of treatment that could in any way precipitate such disease misfortunes The latter we have done to a far greater extent than the former Year after year as we have used greater gentleness and judgment in our treatments we have seen an attractive reduction in the number of complications from treatment causes There still are some dispensaries wherein the irrigating tank is at least 5 feet above the patient's urethral level, where the passage of sounds is routine after the fifth week, or thereabout and where prostatic manipulations are carried out too early and too roughly that run an enormous incidence of such complications as epididymitis acute prostatitis, prostatic abscess and arthritis. In fact, in a report of the medical department of one of the branches of the government service one

finds an incidence of over 14 per cent of epididymitis in patients under twenty four hour supervision. There is scarcely any likeli hood that this is to be attributed in even a small measure to patient conduct. A study of the manner in which those nonmedical attendants delegated to give local treatments apply them, rather quickly would give the reason why one out of every seven treated develops this disabling and unfortunate complication Such a high incidence is not directly to be attributed to the medical per sonnel of that service for the local treatment is done by others and is not always under their direct supervision.

Returning to the incidence of complications in gently treated co-operative patients as compared with those not always so for tunate it is of interest to cite such a study made by the writer a few years ago. While the survey of these patients was made for purposes other than a study of the complications, it brings out the things of present interest and compares in every way with a previous study of 750 cases. This study covered 283 office cases. The reason for the odd number was that it took in 100 cases seen before the sixth day of the disease and the number seen later in the disease during the same period or 183 Prior to their first visits to the writer's office many of these later patients had had a large assortment of different treatments and had been guilty of many indiscretions of conduct. From their first visits on they had no traumatic treatments and every effort was made to eliminate conduct faults.

Let us get the question of posterior urethritis out of the way first. Of the 100 cases seen before the sixth day of the disease as has been cited elsewhere 14 had a posterior infection when first seen and of these 8 had had alcohol or coitus during the incubation period and 3 had been given anteroposterior irrigations elsewhere with immediate posterior involvement. Six of the remaining 86 cases were nonco-operative leaving 80 patients in whom treatment had a chance to prevent posterior extension. Of these in 68 or 85 per cent the disease failed to extend into that portion of the canal and 12 or 15 per cent did have such ex tension.

Of the 183 cases appearing after the fifth day of the disease all but 12 had a posterior infection on admission and only 2 of

the 12 escaped it later In other words, 181 of these 183 patients had a posterior extension of the disease

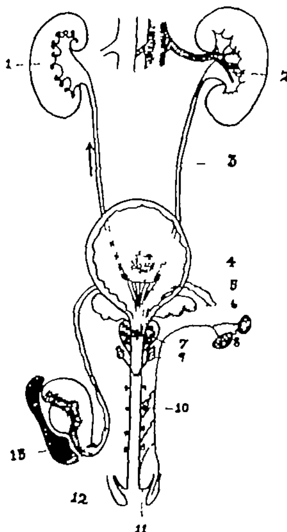


Fig. 74.—Urogenital sites of extension of urethral infection by the gonococcus (Diagrammatic, after Legueu and Papin) 1 Nephritis. 2, Pyelitis. 3, Ureteritis 4, Cystitis. 5 Trigonitis. 6, Seminal vesiculitis. 7 Prostatitis. 8, Inguinal adenitis (bubo) 9, Cowperitis. 10, Folliculitis. 11 Balanoposthitis. 12 Epididymitis. 13 Inflammatory hydrocele.

Prior to or at the first visit, 78 patients had 89 complications other than posterior urethritis, which were as follows

Epididymitis	37
Arthritis	16
Acute prostatic swelling	16
Prostatic abscess	3
Follicular abscess	5
Cowper's abscess	3
Seminal vesiculitis (see chapter on this)	2
Parafrenal abscess	1
Para-urethral sinusitis	3
Indurated corpus spongiosum	1

Of these patients later treatment was carried out by the writer upon 148, with a complication incidence as follows

Epididymitis	4
Acute prostatic swelling	4

(Two of the cases of epididymitis followed gross patient misconduct Three of the cases of acute prostatic swelling followed sexual intercourse and one resulted from prostatic massage applied earlier than was wisest.)

The complications occurring in the group of 100 cases seen before the sixth day were as follows

Epididymitis	4
Parafrenal abscess	2
Follicular swelling	1

(Two of the cases of epididymitis followed gross patient misconduct and two occurred the day after admission in patients who were posterior when first seen)

Faced with such figures there is but one conclusion to which one can arrive regarding the causes of most of the complications of this disease With a pre-admission incidence of 42 6 per cent of complications other than posterior urethritis as against 5 4 per cent in patients who with few exceptions were co-operative and whose treatment was nontraumatic one is forced to the opinion that the two most valuable things in the treatment of gonorrhea are good patient conduct and gentleness of treatment procedure Not only do the two give enormous dividends in the prevention of complications but they are of even more value in obtaining cure with mildness of disease course

That we may feel greatly encouraged regarding the question of gentleness is shown by the previously mentioned change that has occurred within the last ten years, particularly in the first half of this period. In the first and second editions of this book there appeared 48 histories depicting what appropriately were called "treatment atrocities" These were selected from over 250 such histories culled from only a small section of the writer's history files. Many times this number could have been found at that time (1927) So greatly did things change in the succeeding five years that it is highly probable that not more than 25 could be found among those patients seen by the writer in the last five years There are of course many that show rather poor judgment or a lack of deep knowledge regarding the disease itself on the part of the physician but, to an enormous extent, the old, hurtful plans of treatment have been discontinued. It now remains for us to make equal strides toward better patient control if we would approach the ideal in complication reduction and relieve mankind of a needlessly heavy burden

In the section devoted to the individual consideration of the various complications the most common precipitating factors for each will be taken up in detail

XXXII. ACUTE PROSTATITIS

THE above title is used to designate those acute swellings of the prostate gland that, at times, occur during the course of acute posterior urethritis One who views the structure of this gland will find reason to wonder why this condition does not occur in the majority of cases wherein the gonococcus finds its way into the gland acini. Indeed, it seems almost inconceivable that such infections, in all but a small number of cases, should be of such a symptomatically silent character, in view of the behavior of this infection in the epididymis

Etiology—While some few cases of acute swelling of the prostate occur without an apparent precipitating cause other than the infection, by far the large majority are the result of injudicious modes of treatment. Most of them are caused by digital manipulations of the gland during the early stages of its infection while some few follow the premature use of urethral instruments Thus this lesion, like most of the other complications of gonorrhea, definitely can be placed among those that usually have no good reason to be.

Pathology—Not only are the gland acini infected but the entire gland substance becomes enormously swollen In a small percentage of the cases a few small abscesses form while in an occasional case the abscesses are so large that they fill both lateral lobes. Upon extremely rare occasions there may be an abscess form in the median lobe of the gland.

The smaller abscesses either rupture into the posterior urethra or gradually undergo resolution. The larger ones, unless surgically drained usually rupture into the posterior urethra or bladder commonly leaving large pockets for the maintenance of chronic infective processes Upon extremely rare occasions the larger abscesses break either into the rectum or burrow upward toward the peritoneum In one of many thousands of cases, prostatic abscess serves as the initial focus for a gonococcal blood infection.

Symptoms—Symptomatically, acutely swollen prostates divide themselves into two groups. In the first group is that smaller number of patients who, despite an enormously swollen gland

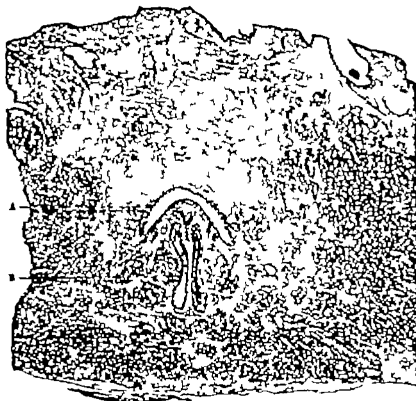


Fig 75—Cross-section of the prostate gland, giving an excellent idea of the complexity of this structure. It is really remarkable, considering the endless number of small mucous spaces in the gland and the minute tubes through which they empty their contents, that sufficient drainage could be established by massage to cause recovery from infection The reasons for the length of time necessary for such cases are obvious. At A we see the verumontanum with the arched space of the posterior urethra surmounting it. At B are the cross-cut ejaculatory ducts. (Courtesy of Dr Henry H Morton)

have few local symptoms and no general ones. Aside from a feeling of fullness in the rectum there is little to suggest the condition.

In our second group which comprises at least 90 per cent of the cases things are entirely different. The symptoms are of so pronounced a nature as to call immediate attention to the fact that

something unusual has taken place In many there is some disturbance of urination in that the stream is difficult to start and is small in caliber Occasionally, there is complete retention The attack may start with a chill followed by an elevation of temperature of from 102 to 105° F More often, there is no chill, the temperature gradually or rapidly rising and accompanied by the systemic symptoms so common to such states. There generally is little definite pain in the region of the prostate. Usually there is a feeling of tension and fullness in or in front of the rectum.

The leukocyte count is markedly elevated and continues so until some days after the subsidence of the fever This high leukocyte count rather often has been viewed as a factor urging the need for operation That such an interpretation is commonly a mistake is shown by the fact that it is present in almost all of the cases and yet, at least 95 per cent of such glands will go on to resolution without surgical intervention if carefully treated.

Generally, after four or five days the temperature subsides and the local discomfort disappears. If an abscess forms, it is common for the temperature to drop to normal or near it and, then gradually rise again. Occasionally abscess formation takes place so rapidly that there is no intervening drop in temperature.

Diagnosis—Sharp elevations of temperature or the development of a sensation of fullness in the rectum during the existence of acute posterior urethral gonorrhea is highly suggestive. This is particularly so if these symptoms follow digital manipulations of the gland or the passage of instruments into the posterior urethra.

Rectal palpation reveals an enormously swollen prostate which extends so far into the rectum as to make it impossible to pass the finger tip above it for palpation Often it is necessary to turn the palmar aspect of the finger toward the hollow of the sacrum and palpate with its dorsal surface to obtain an idea of the size of the swelling (Figs 76 77)

The gland is tense and gives the impression that its bulk has abscessed. Indeed to one not familiar with such a condition there is a great likelihood of making such a diagnosis.

As the result of treatment, the gland reduces rather rapidly in size and if there is abscess formation this reduction in size is

seldom equal on both sides. Thus where there is an unequal reduction in size accompanied by a second elevation of temperature, one is rarely in error if he makes a diagnosis of abscess and

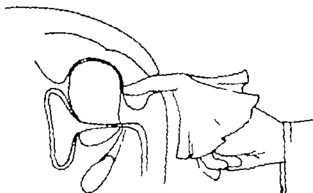


Fig 76—Digital palpation of the acutely swollen prostate gland.

insists upon surgical drainage He, however should not be swayed in this direction by the continued elevation of the leukocyte count, as has been said. It is present in those who have an abscess and in those who do not. As is the case with all prolonged temperature

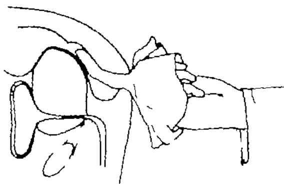


Fig. 77—In order to estimate the size of a greatly swollen prostate gland, it often is necessary to turn the intrarectal finger toward the hollow of the sacrum and palpate the gland with the dorsal surface.

elevations in this disease it is well to be on guard lest there be a true blood infection and if the temperature elevation is continuous blood cultures should be made

Treatment—Few complications of gonorrhea of such seeming

gravity respond more promptly to treatment and leave so little evidence of their former presence. Wherever the temperature rises above 101° F the patient should be placed in bed. This is not an unwise thing to do with all cases. Even though the early stages of the disease failed to respond to sulfanilamide medication it should be tried again, if there is not an idiosyncrasy to the drug. Upon occasions, this drug causes an almost immediate subsidence of both the prostatic swelling and the temperature. The writer recently saw a patient in whom an enormously swollen gland was reduced to its normal size in three days.

When sulfanilamide fails to cause prompt improvement the treatment of choice is rectal heat. A study of Figs 76 and 77 will show that much care must be used in a choice of the method whereby such heat is applied. In view of the fact that it takes little



Fig. 78.—The author's modification of the Boyd rectal irrigator. (Made by the C. R. Bard Co.)

trauma of such a gland to precipitate abscess formation. A study of the instruments whereby heat usually is applied to the rectal aspect of the prostate will show that few of them are safe. In such cases the finger strikes the gland at not more than 1 inch above the anorectal line and cannot be advanced further in a straight direction. All of the rectal electrodes for medical diathermy and all of the psychrophores are of such shape as to make them particularly dangerous instruments for such cases. If they do not cause abscess formation in the gland they rather commonly precipitate epididymitis. No instrument for this purpose should be introduced further than ¾ inch beyond the anorectal line.

In order to fill this requirement the writer had the C. R. Bard Co. make for him a shortened model of the Boyd rectal irrigator tube so that it could not pass far enough upward to traumatize the gland (Fig. 78). The manner in which the instrument is used

is shown in Fig. 79 and it will be seen that, by its use, heat safely can be applied In lieu of this instrument one can tie the ends of a No 16 and a No 20 French soft rubber catheter together, using the small one for the inflow tube and the larger for the outflow Carefully used this does not traumatize the gland

Water at a temperature of 110 or 112 F should be allowed to flow into the rectum from a fountain not too high above the rectal level for from ten to twenty minutes once a day or more often depending upon the acuteness of the condition. If a rubber tube is attached to the outflow tube, such treatments can be

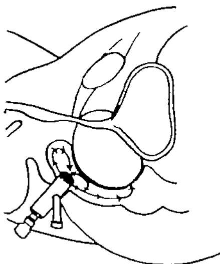


Fig. 79.—Rectal lavage with the author's modification of the Boyd rectal irrigator Note that it does not extend far enough into the rectum to traumatize a swollen prostate gland

carried out in bed, otherwise they are best done with the patient lying in a bathtub. Carefully done this rapidly reduces the swelling and with the reduction the temperature subsides. No digital stripping of such a gland should be done within three weeks of its complete restoration to normal size.

Prompt relief of swelling and symptoms has been reported from the employment of prolonged hyperthermia but one need not feel that he is guilty of neglect if he does not urge such dangerous measures in view of the eminently successful results of more innocent modes of treatment.

XXXIII EPIDIDYMITIS

GONORRHEAL epididymitis is variously stated by different authorities to occur in from 10 to 30 per cent of all cases of the disease Having occurred it is said to render from 23 to 41 per cent of such individuals permanently sterile. Obviously, a gonorrheal complication of such frequency and far-reaching influences is a very important thing to the human race, and anything that even in a small measure can reduce its incidence is worthy of the closest study Of all of the complications of gonorrhea it is probably the most easily preventable and in order to reduce its incidence, we must have a better knowledge of its causes.

Etiology—We have indulged in much discussion in this regard and much of it has been rather fanciful There have been given a number of answers to the question 'How does the gonococcus reach the epididymis? Most of these have had little to recommend them and if true are but rarely so

Much has been said about lymphogenous and hematogenous transferences of the gonococcus to the epididymal tube Despite some meager evidence that bacteria injected into the posterior urethra of a guinea-pig may at times pass along the lymphatics of the vas deferens there is little to substantiate the thought regarding man. It is so out of accord with our clinical knowledge and the histopathology of the disease that it merits but little comment.

Infection by continuity of surface is likewise unusual. If we accept this as an answer to many cases we must abandon most of our accepted causal factors of treatment and hygiene There are likewise a number of anatomic and physiologic arguments against it The ejaculatory duct is about 2 cm and the vas deferens is 45 cm long and the gonococcus must spread all of this distance against the current of fluid and the peristalsis of the vas. The development of epididymitis after the occurrence of known determining events is far more immediate than could be occasioned by such a mode of bacterial progression for the disease does not

spread such great distances so rapidly It also has been pointed out in an earlier chapter that long, narrow mucous channels rarely become infected through continuity of surface, despite the fact that they are lined by the most susceptible type of cells. If further argument were needed, it would be but necessary to cite the well known clinical observations that, in at least 98 per cent of our cases, the epididymis is inflamed before the vas deferens, and the vas generally becomes inflamed at its epididymal extremity first.

Of all of the answers to our question we have heard most of reverse peristalsis. In this, too we can find some decided flaws To be due to reverse peristalsis it would be necessary for the ejaculatory duct and the vas deferens to reverse their peristaltic wave while the seminal vesicle underwent its normal mode of con traction. It has been demonstrated repeatedly that substances injected through the ejaculatory duct enter the seminal vesicle before they can pass into the ampulla of the vas Not only do they enter the vesicle but, unless of a highly irritating nature they fill it before anything passes into the vas. Such being the case, it is hardly likely that a peristaltic wave of the ejaculatory duct if such were possible, could deliver sufficient fluid from the posterior urethra to fill the vesicle. Perhaps the greatest flaw in the thought is the fact that the ejaculatory duct contains no circular muscle fibers to make a peristaltic wave possible, and without such a wave the theory lacks plausibility Such a reverse peristaltic wave may occur in the vas deferens but what trouble could it occasion unless the infective material were delivered to its lumen via the ejaculatory duct and seminal vesicle?

With so few things in favor of these theories, and so many stronger arguments against them we shall do best to look in other directions if we would explain the transit of the gonococcus from the posterior urethra to the epididymis in most cases. As the symptoms of the affection generally occur well within twenty four hours following some definite mechanical event, they must be due at first to a toxin response. The implantation of the viable gonococcus could not cause such an immediate reaction. It would in such an event, be necessary for the implanted gonococci to complete their life cycle and liberate their endocellular toxin

through autolysis. Reasoning from our observations upon the urethral mucous membrane in regard to its toxin responses, there must be delivered to the epididymis some older gonorrheal products rich in gonotoxin to occasion such an immediate response as usually is seen

Just how does this gonotoxin laden pus reach the epididymal tube? To answer this question, let us see first what we long have



Fig. 80—Roentgenogram of the seminal tract. The injection was made into each vas deferens, and the fluid has dilated the proximal structures on both sides and escaped via the urethra into the bladder On one side it has passed into the epididymal tube (Courtesy of Dr Harry C Rolnick)

believed regarding certain predisposing or determining events. The occurrences most likely to be followed by epididymitis according to our textbooks are the rough and unscientific use of instruments in the posterior urethra irrigations or injections forcibly given sexual excitement and excesses violent physical exercise digital manipulations of the prostate and seminal structures

or great increases of intra-urethral and intravesical pressures.[7] Briefly some mechanical transference of purulent products from the one point to the other

The way through the conducting structures, from the posterior urethra to the epididymis is long and tortuous, and such a method

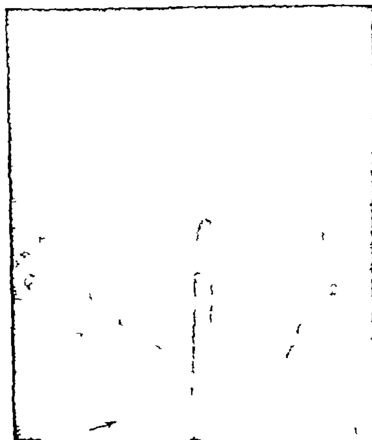


Fig. 61—Roentgenogram of the seminal vesicle ampulla, and vas deferens. The fluid has been injected through the ejaculatory duct and, after filling the vesicle, has passed along the vas deferens t least as far as the arrow on the lower left of the picture (Courtesy f Dr O S Lowsley)

of transporting gonorrheal pus, at first, seems questionable Let us see what other data have been gathered in favor of it. It has been shown repeatedly by the roentgenograms of substances in-

jected into the seminal vesicle via the ejaculatory duct that, in some individuals after the vesicle is entirely filled, some of the solution finds its way down into the vas deferens (see Fig. 81) This, in itself, proves that where the pressure is sufficient, fluids can be made to reach the epididymis, and all of our physical causes mean such pressure.

There is however greater proof to be found in Belfield's report of his experiences following his operation of vasostomy This operation is done by making an opening in the vas deferens just below its point of emergence from the inguinal canal, for the injection of germicides into the seminal vesicle. It was his observation that in a number of such individuals a few drops of urine would ooze from the opening in the vas when the bladder was quite full. Such an observatron seems to give us the best answer to our question If urine can come from the bladder into the posterior urethra, ejaculatory duct, seminal vesicle, and find its way to the junction of the middle and lower third of the vas deferens it should have no more trouble in reaching the epididymal tube After some years of observation, the writer is of the opinion that such is the only worth-while explanation of the matter in at least 98 per cent of the cases and offers us simple means of preventing epididymitis by avoidance of the things that could act as a cause

It has been the writer's experience to have some urologists combat such a simple explanation of the matter and use as arguments against it their experiences with epididymitis following prostatectomy But little study is required to show that their experiences offer almost incontrovertible argument for direct pressure transference of infection They directly manipulate the subvesical structures at operation, and few bladders are subjected to greater internal pressure than those of 'prostatics" But, they say "*It is some days before there are any signs of inflammation* of the epididymis There should be for they are not dealing with a micro-organism the toxin of which produces an almost immediate toxin response It should take three or more days for it to develop from the direct implantation of the bacteria concerned. They cite the occurrence of epididymitis following the use of an indwelling catheter when there is no increase of intravesical pres-

sure. Investigation of such cases probably will show that the epididymitis occurred within the first five days of the presence of the catheter and that the infection really followed the first efforts to empty the bladder As further argument, they speak of the cases occurring long after prostatectomy It should not be forgotten that most of this latter class occur shortly after the establishment of urethral urination, at a time when the postoperative swelling of the posterior urethra has subsided so that the torn or untorn ends of the ejaculatory ducts are no longer closed by such swellings. If more argument were needed, they have supplied it by showing that postoperative epididymitis does not occur if they ligate and sever the vasa deferentia before prostatectomy

In addition to these proofs offered us by the surgeons let us see what other arguments we have in favor of the mechanical transference of pus from these two points, for if we are correct, the prevention of the complication should become a simple matter We merely should have to avoid certain faults of treatment, and have the patient avoid certain faults of conduct to obliterate epididymitis. After a number of years experience the writer is convinced that such a result is easily obtained. The matter being of such far-reaching importance, a summarisation of our points of proof is not without value

1 Urine passes down the vas deferens in some individuals when the bladder is full.

2 Unless of the nature of a chemical irritant, which Lespinasse has shown throws the vesicle into spasm fluids coming via the ejaculatory duct balloon the seminal vesicle before passing into the vas

3 It is, therefore obvious that the amount of fluid must be large unless the vesicle already is full.

4 It is common knowledge that in many patients the internal vesical sphincter relaxes when the bladder is quite full, particularly if the intravesical pressure is raised, and the posterior urethra becomes virtually a part of the bladder cavity Its purulent contents therefore are subjected to the same degree of pressure.

5 The ejaculatory ducts are freely patulous in some individuals, as evidenced by the presence of spermatozoa in their morning urine in the absence of an orgasm.

6 The ejaculatory ducts present no musculature that could occasion a reverse peristalsis.

7 The vas deferens and ampulla offer too many obstacles to such a rapid spread of infection by continuity of surface, and in order to receive the infection the vesicle first must be supplied with it.

8 The histories of these unfortunates usually will show that within twenty four hours preceding the onset of epididymal symptoms they indulged in coitus sexual excitement or strenous exer cise with a very full bladder that some form of treatment was carried out that either enormously raised intra urethral and intra vesical pressure, or that pressure was made on the seminal vesicles so that infective material delivered to them by the former was forced into the vas deferens and on to the epididymal tube.

Such overwhelming evidence in favor of a truly mechanistic view of the determining causes of epididymal involvement by the gonococcus is a highly fortunate circumstance. We have only to find a way to avoid certain things and we at once reduce the com plication almost to a point of obliteration. Fortunately too the treatment factors that must be avoided are those that should be avoided regardless of epididymitis for they are generally too strenuous for a disease requiring the utmost gentleness for its cure Further the restraint that must be placed upon the patient if he would avoid the complication is of a nature that should not cause him to rebel once he is made to understand its importance.

If the following rules are carried out by the physician in his treatments of posterior urethritis and its concomitant prostatitis, and by the patient in his daily conduct the present incidence of gonorrheal epididymitis practically will cease to be

1 Patients should be carefully warned against indulging in sexual excitement, coitus or strenuous physical exercise during the existence of posterior urethritis particularly if the bladder is full It is extremely doubtful if either will occasion epididymitis if the bladder is empty

2 Nothing should be injected into an acutely inflamed posterior urethra until the patient entirely has regained his vesical comfort. The vesical spasm occasioned thereby is often a matter of danger

3 When the local treatments are instituted following acute posterior urethritis, the irrigating fountain should never be more than 3½ feet above the urethral level, and the bladder should not be distended fully with the fluid.

4 No instruments should be passed into the posterior urethra during the presence of the gonococcus, except for the relief of complete urinary retention where one at times may have no choice of action. Usually the removal of the fright element and a hot hip bath will obviate such a necessity

5 Digital manipulations of the prostate and seminal vesicles never should be performed until long after all acute symptoms have subsided They should be done with care and caution so long as the gonococcus is present.

6 The utmost gentleness in every form of treatment, keeping constantly in mind the dangers of high pressure of any type, will be the means of obliterating epididymitis as a doctor's misfortune, and proper instructions to the patient greatly will reduce it as resulting from his fault. Both will likewise prevent most of the other complications of gonorrhea that help to make it such a formidable disease.

Pathology—Gaining entrance into the epididymal tubule by means of back pressure or far more rarely by continuity of sur face infection along the vas deferens the gonococcus penetrates between the cells of the canal and produces the same pathologic picture that is seen in other similar mucous surfaces. There is however much peritubular swelling with varying amounts of cellular infiltration. At times small or large abscesses form in the interstitial tissues and upon the rarest of occasions the swelling may be so great as entirely to prevent tissue nourishment with a resultant gangrene of the epididymis and perhaps, the testicle Often there is an associated inflammatory hydrocele.

In at least 98 per cent of the cases spontaneous resolution slowly takes place but there almost always is left an indurated area in the lower pole of the epididymis. In an undetermined number the tubule establishes its lumen while in others it remains permanently blocked entirely preventing the transit of spermat ozoa from the testis. While this is usually a permanent blockage it is not of necessity so The writer studied one patient's semen

for years after a bilateral epididymal involvement without finding a single spermatozoid. Several years after the last study he returned with the statement that his fiancée insisted that she was pregnant. The lady was not only correct but study of his semen showed it to be teeming with actively motile sperm. His epididymitis had occurred about twelve years before and, certainly there were no sperm present during the five years he was under the writer's observation.

Symptoms—The onset of symptoms is usually rapid, coming on within twenty four hours of the precipitating event. First there is aching and tenderness followed by swelling The temperature elevation varies between 100° F in the milder cases, to 105 or more in the more severe ones At times the swelling is moderate and remains so at others it is slight for a few days and then suddenly increases. More often, however, it reaches great proportions within the first two days. Those cases, in which the epididymal swelling is marked show much redness of the scrotal skin.

Pain often is excruciating and the tenderness is extreme for the first week. Unless abscess formation occurs or treatment causes a more rapid change the pain gradually subsides after this time the tenderness becomes far less acute and the swelling gradually subsides. Should abscess formation occur the pain increases, the temperature again rises the scrotal skin takes on a bluish red color and unless it is drained surgically the structures become attached to the skin and rupture through it.

Where infection occurs by continuity of surface along the vas deferens the early symptoms may be decidedly misleading Swelling of this structure may obstruct the ureter where it passes between it and the bladder giving symptoms of acute ureteral block, with its resultant severe renal pain. Usually such symptoms subside within twenty four hours by which time the epididymal swelling directs attention away from the kidney

When occurring on the right side the condition rather commonly is mistaken for acute appendicitis, and not a few surgeons have suffered the chagrin of taking out a normal appendix only to face an epididymitis on the following day So real is this danger that one should delay appendectomy in gonorrheal patients for

twenty four hours whenever possible Particularly is this true in those who are given great pain by the passage of the finger into the right inguinal canal.

Concomitant involvement of both epididymes is rare, but it is not so unusual for the second one to become infected after the other has subsided. Recurrent attacks are by no means uncommon.

Diagnosis—As a rule little difficulty is encountered in making a diagnosis of gonorrheal epididymitis in the presence of an acute attack of the disease During the quiescent stage it is not always done with an equal degree of sureness, however Both nonspecific and tuberculous epididymitides can produce identical

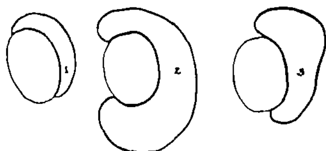


Fig. 83.—Outline of the usual shape of the (1) normal epididymis, (2) gonorrheal epididymitis, (3) tuberculous epididymitis. Syphilitic epididymitis may resemble either 2 or 3

symptoms. The former is by no means rare. The dangers of confusing some few cases with acute renal lesions or appendicitis has been cited Luetic epididymitis is rarely of acute onset and is not painful nor tender It almost always is associated with a positive blood Wassermann.

Prognosis—So far as recovery is concerned the prognosis is excellent. Establishment of the lumen of the epididymal tube however is not always accomplished permanent obstruction being a common result. When occurring on one side only this is not a matter of much moment. Occurring bilaterally it results in permanent sterility for a large percentage of individuals. Studies by Benzda of soldiers in the German Army (cited by Barringer) showed that 10 5 per cent of those with gonorrhea without epidid

ymitis had no children thereafter as against 23 4 per cent of those with unilateral epididymitis and 41 7 per cent of those who had bilateral involvement. This does not of necessity say that all of them were sterile. The wives might have been victims of the same disease It usually is considered that about half of those who have bilateral epididymitis are sterile thereafter

Abscess formation is unusual and gangrene extremely rare.

Treatment—The introduction of the intravenous use of the calcium salts has been a great boon to sufferers from epididymitis,

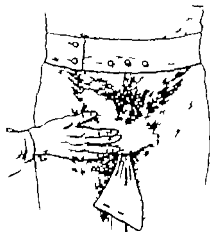


Fig. 83

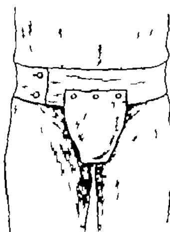


Fig. 84

Figs. 83 84—In the use of the jock-strap the scrotal contents are pushed forward on a nest of cotton and the anterior flap is drawn over them *The waist* band is pulled well up so as to exert support and pressure Both are best obtained with a smaller size than would be used ordinarily for the individual in question

for in over 50 per cent of the cases a rapid subsidence of symptoms occurs following its use In about 25 per cent the results, though good are not quite so prompt and striking while in perhaps another 25 per cent it seems to do little good. At first calcium chloride (10 cc. of a 10 per cent solution) was injected daily for from four to seven days. This now has been replaced largely by the gluconic acid salt of calcium calcium gluconate, which is far less toxic and does not cause irritation to the vein or the surrounding tissues if any of it escapes The usual method of its administration is by the daily intravenous injection of 10 cc.

of a 10 or 20 per cent solution. Calcium gluconate also can be given orally in the dose of 60 grains three times a day preferably an hour before meals. The solution also may be used by intra muscular injection.

Concurrently with the use of this substance a scrotal dressing giving both support and pressure should be applied For the milder cases a tight fitting jock-strap (Figs. 83, 84) having little elasticity serves the purpose well. In the more severe cases a double spica bandage (Fig 85, A to F) is better or one can apply the adhesive plaster dressing described by Collings. With each dressing the scrotal contents should be held well forward and a moderately thick nest of cotton should be interposed between the support and the scrotum. It also is well to arrange things so that urination can be accomplished without disturbing the support. The dressing should be worn day and night.

Under the above plan of treatment most patients can be kept ambulant or need be confined to bed for a few days at most. In bed patients much comfort and benefit follows the use of local heat, though patients occasionally get more benefit from an ice-bag. In all patients having a temperature of 101 F or over rest in bed should be insisted upon until it subsides.

Many have reported rapid subsidence of the swelling and al most immediate relief of pain from the use of prolonged hyper thermia. Few reports suggest that sulfanilamide is highly bene ficial in this complication Corbus some years ago advised diathermy applied by means of two insulated pads one on each side of the involved structure and many have reported excellent results from the procedure.

Except where definite abscess formation can be demonstrated the writer can see little use for surgery As a rule Nature does a far better repair without epididymotomy He admits that it may have a place in the rare case in which the temperature is high, the pain and swelling are great and other means of treatment have failed.

The commonly associated inflammatory hydrocele usually disappears without direct treatment. At times tapping may be indicated.

XXXIV SEMINAL VESICULITIS

IN the years intervening between the first edition of this book and the present, the writer has seen no reason to change his opinion regarding the rarity of true gonorrheal seminal vesiculitis Certainly he cannot agree with those who consider that the vesicles must be infected every time a gonococcus reaches the prostate gland and who urge the use of the term prostatovesiculitis for all cases of gonorrheal prostatitis. Not so long ago it was his privilege to read the answers to a questionnaire which had been filled out by a number of those who make use of the above compound term. Many gave reason for their belief in the constant association of infection in both of these structures much in this way "I don t see how it could be otherwise considering the close association between the two and the posterior urethra."

We know perfectly well that infections of the vesicle occur by way of the ejaculatory duct and if their reasoning were correct, there is just as much reason to believe that Cowper's glands would become infected every time the gonococcus infects the anterior urethra for certainly there is little difference between the ducts through which each empties. Assuredly the work of Ritter and his co-workers adds little in view of the frequency with which the chronic inflammations found by them at autopsy were confined to the ejaculatory duct alone

Aside from all this, there is undeniable clinical evidence that gonorrheal seminal vesiculitis is not of common occurrence It has been pointed out that, whenever an accumulation of gonococcal products is emptied into the urethra, there is a toxin response characterized by an increase of urethral discharge in which the gonococcus easily is demonstrated In neither sex is there a more ideal structure for the development and storing of quantities of gonococcal toxins Consequently the patient with a gonococcal infection in no way could escape a recrudescence of discharge every time the vesicle emptied itself It should be and undoubtedly is an invariable rule Clinically such a reaction does not

occur in more than 1 or 2 out of every 100 cases In office pa tients the number is far less than this.

Further, if gonorrheal seminal vesiculitis were of common occurrence, the writer would have had a steady parade of patients returning after apparent cure with the statement that they had transmitted infection, a thing that has not occurred to date For unless a patient has shown a recrudescence of urethral discharge following an involuntary seminal emission, he has paid absolutely no attention to the vesicles. No one who has treated this type of vesiculitis has any idea that such patients go on to cure with such vesicular neglect.

Unquestionably most seminal vesicles are highly resistant to gonococcal infection. For there can be little doubt regarding the entrance of the gonococcus into the vesicle of most, if not all pa tients who have epididymitis. It previously has been pointed out that fluids coming either by way of the ejaculatory duct or the vas deferens enter the vesicle before they flow onward. Attention, also was called to the fact that closed cavities constantly in contact with the same gonorrheal pus accomplished their own sterilization. This likewise may account for the fact that demon strable vesiculitis is so rare as involuntary emissions are unusual during the active stages of posterior urethral involvement. Usu ally they are confined to the later stages of comparative quiescence giving ample time for vesicular sterilization if such infection is as common as many hold it to be.

Symptoms—Acute seminal vesiculitis usually is associated with a rise in temperature pain along the spermatic cord perhaps in the sacral region and a feeling of heat and fullness in the rectum As all of these symptoms may occur in acute gonococcal swellings of the prostate gland it is not always possible to differ entiate one cause from the other In both also there often is much vesical intolerance to even small quantities of urine.

During the later stages aside from the increased urethral discharge following seminal emissions the condition usually is a largely silent one so far as sensory symptoms are concerned. Few of the patients complain of symptoms that are not far more com monly encountered in the presence of prostatic infections alone

Diagnosis—The diagnosis of acute seminal vesiculitis is by no

means an easy thing, as a rule There may be occasionally, a large, sausage-shaped, throbbing mass in the region of the vesicle. *More often this is not to be felt and the structure feels the same,* to the rectal palpating finger as does any seminal vesicle that has not been emptied for some time. At times a disparity between the comparative sizes of the two vesicles may suggest that there is infection in the larger one

In the later stages when digital stripping of the vesicle is safe, a diagnosis at times, may be made by the demonstration of pus cells deeply entangled in the mass of expressed vesicular fluid One however easily can be misled by such a study and interpret prostatic pus as having come from the seminal vesicle as the prostatic secretion always contains pus when the vesicles are infected *Unless pus can be seen deep in the masses of vesicular* jell it should not be assumed to have come from the vesicles. Certainly those pus cells in the freely flowing fluids surrounding the vesicular jell should be considered as of prostatic origin

In order more safely to study the fluids expressed from the vesicles, when such a procedure is safe, it is wise to carry out a preliminary stripping of the prostate gland and have the patient urinate before attempts are made to secure the vesicular contents. In this way much of the prostatic pus is removed and if one only strips the midline of the gland after he strips the vesicle he will come nearer to diagnostic accuracy If one vesicle is stripped and the patient passes some more urine to flush out the urethra before the other one is emptied, it may be possible to differentiate between the two vesicles.

Treatment.—The treatment of acute vesiculitis is the same as that used for acute inflammatory swellings of the prostate Sulfanilamide even though it may have failed to control the early stages of the disease, should be tried barring contraindications to it. Rectal heat, used in such a way as not to put pressure upon the subvesical structures, should be resorted to several times a day The patient should be confined to bed and such medicinal measures used as pain, vesical intolerance and other symptoms may require. It is possible that prolonged hyperthermia might be dramatically beneficial in some patients

The treatment of *chronic gonorrheal seminal vesiculitis* con

sists of vesicular strippings preferably on alternate days. These however should not be started until some time after all evidence of acuteness of the disease has subsided, and the first few treatments should be done with extreme gentleness if epididymitis is to be avoided. The reason for such frequent vesicular strippings is that they prevent the accumulation of large quantities of gonotoxin and thus reduce the likelihood of marked urethral recrudescences of discharge as the result of treatment. It is the writer's custom to strip both the prostate and vesicles of such patients twice a week, having the patient visit him between these treatments for a vesicular stripping alone. Prostatic infections respond better to treatments spaced three or four days apart than they do to more closely spaced ones.

XXXV INFECTIONS OF COWPER'S GLANDS

Infections of Cowper's glands are by no means so common among office patients as with the usual run of gonorrheal patients who visit dispensaries. Almost, its incidence is controlled by the intelligence one has shown in taking care of the older urogenital lesions he has known were present. Because urethral stricture is more likely to form in the negro, a large majority of the abscesses of these glands are encountered in that race Not only do they have more strictures but most of them do less about them.

Etiology—Because the gonococcus rarely passes unaided through long narrow mucous channels infection of Cowper's glands is almost entirely confined to those individuals who have a *pathologic narrowing of the urethra distal to the duct openings* or who have received high-pressure irrigations or injections—in other words, those patients who are subjected to sufficient intra-urethral fluid pressure at urination or by treatment to force infection along the duct to the gland itself By far the most common cause is the great increase of urinary pressure due to the presence of a stricture of small caliber A pinpoint urethral meatus may cause an equal degree of urinary back pressure. Upon rare occasions these structures become infected in the entire absence of marked increases in intra-urethral fluid pressures

Pathology—In probably more than 90 per cent of the cases wherein these glands become infected abscess formation takes place Such an outcome is the rule with those having marked urethral narrowing as the result of a neglected stricture or a pinpoint urinary meatus In those whose gland infections occur as the result of moderately forcible injections or in whom infection occurs by continuity of structure along the gland duct, abscess formation is unusual. In them there is some enlargement of one or both glands which persists as a smouldering focus of infection. There commonly is in them some periglandular infiltration as well.

Abscesses of Cowper's gland break through the gland capsule and almost always point toward the perineal skin If not incised

they break through on their own side of the midline. If the urethral narrowing is not cared for, they continue to discharge pus for a long time and there occasionally form one or more fistulous tracts connecting with the bulbar portion of the urethra. Abscesses of Cowper's glands upon extremely rare occasions, have failed to point toward the skin surface but have burrowed upward into the cellular tissues of the pelvis. Some few have ruptured into the rectum

Symptoms.—Infections of Cowper's glands that fail to go on to abscess formation give no local symptoms suggestive of their presence Their infection usually is suspected because an anterior urethritis does not clear up or because after rendering an infected prostate free from pus gonococci still are found in the scanty urethral discharge that remains. Usually this urethral discharge varies in amount. It reduces to almost none and then, without apparent cause increases for a day and subsides This behavior late in the course of the disease, and the chronicity of the infection always should direct attention to these structures. Even where the gland cannot be felt, the mere fact that palpation of it causes a recrudescence of urethral discharge is sufficient proof of its infection.

In the presence of abscess formation there develops a painful swelling to one side of the bulb of the corpus spongiosum which upon rectoperineal palpation, easily is determined to be located where the gland should be There is constant pain which naturally is greatly increased by walking or sitting. Temperature elevation varies in different individuals but it seldom is above 101 F

Diagnosis.—The diagnosis of cowperitis rarely is difficult. Normally these glands cannot be palpated Consequently it is safe to conclude that any gland that can be felt upon rectoperineal palpation is an infected one. Occasionally the periglandular infiltration is such that the gland cannot be mapped out. Even here it is safe to conclude that the patient with gonorrhea in whom one side of the perineum is thicker than the other has an infected Cowper's gland on that side If both sides give the digital sensation of tissue infiltration one rarely errs in making a diagnosis of bilateral cowperitis.

The method of palpating Cowper's glands is well shown in Fig. 86 The tip of the intrarectal finger is drawn down over the arch of the pubic bone about ½ inch to the side of the mid line. As it drops from the edge of the bone it, in thin patients falls into a triangular depression in which a swollen gland is easily



Fig 86 —Method of palpating Cowper's gland

felt by rolling the intervening tissues between the intrarectal finger and the thumb against the perineal skin. In fat patients and those with a highly developed perineal musculature it is not always so easy to palpate moderate-sized glandular enlargements. One often must base his diagnosis upon the differences in thick

ness between the two sides. Assuredly, too much reliance should not be placed upon pain sense in the nonsuppurative gland infections. There always is pain when even normal perineal tissues are palpated in this way and it occasionally is more pronounced on one side than on the other

In the presence of the true abscess formation, the great difference in thickness between the two sides and the fact that even slight pressure causes greater pain than normally is occasioned by palpation, rarely leave any doubts in the examiner's mind. Ischiorectal abscesses usually are far more diffuse and, by the time they even come near pointing toward the perineal skin, fluctuation usually can be elicited. Abscessed rectal fistulae are more posteriorly placed and usually are in close association with the rectal wall and anal canal.

Treatment.—From a consideration of the usual causes of gonorrheal infections of Cowper's glands it is obvious that treatment should start with prevention. Methods of treatment that cause the outpouring of round cells with their eventual fibrous tissue change, should be avoided Patients should be encouraged to have known strictures dilated and in accomplishing this, nothing is of more importance than a knowledge of their dangers on the patient's part and the utmost gentleness of procedure on the part of the physician. Patients who neglect strictures most commonly do so because they fear the pain of dilatation In such patients pain should be controlled by local anesthetics and one should try to overcome the ever-present temptation to dilate too quickly Those with a pinpoint meatus should have a meatotomy before they get gonorrhea.

The nonsuppurative gland should be treated by digital massage twice a week. Usually this will bring about cure but, if it does not and there are no other demonstrable feeding foci, excision is justifiable. This is a very simple procedure. The intrarectal finger pushes the gland toward the perineal surface where it easily can be removed through a small transverse incision

Abscesses should be incised freely and lightly packed to insure proper drainage To prevent recurrences after incision it may be necessary to start the dilatation of stricture bands however much one dislikes the use of urethral sounds while the gono-

coccus is present. Later, when the periglandular infiltration has subsided, and particularly if the urethral infection continues, it may become wise to excise the remnants. This is rather strongly indicated in patients who refuse stricture dilatation. As a rule they are great collectors of gonococci and they have an abscess of the gland with each subsequent attack of the disease

XXXVI. GONORRHEAL ARTHRITIS

In gently treated, co-operative patients, metastasis to the joints is and should be a rare complication of the disease. Keyes stated some years ago that he had seen but 2 cases among the many treated by him in his office and the writer has seen but 3 in the cases he has treated. One of these followed a meatotomy, another occurred after the incision of a para-urethral sinus into the urethra and the third occurred in a poorly behaved patient while under sulfanilamide administration. A study of the occurrences immediately preceding the onset of arthritis usually will reveal some traumatic procedure that served to introduce the gonococcus into the blood stream It, therefore, can be classed as largely a preventable complication. It is probable that a comparison of its incidence today when most forms of treatment are gentle, with that of 10 or 20 years ago when the reverse was so largely the case would show a great reduction in the number of cases.

Etiology.—Gonorrheal arthritis is due to the transference of gonococci from an active lesion in the urogenital tract or rarely, the conjunctival sac. Such transferences rarely take place in the absence of direct trauma to the primarily infected area. The predominance of its occurrence in dispensary patients and those upon whom urethral instruments have been used early in the disease, leaves little doubt about its overwhelming dependence upon direct trauma. It, of course is possible that the gonococcus may find its way into the blood without local trauma, but the more closely one studies the histories of patients having this complication the surer is he to feel that such patients do not represent any large percentage of the total.

Pathology.—The older idea that gonorrhea of the joints is predominantly a monarticular involvement is most certainly not in accord with the results of recent analyses of cases. In them at least 75 per cent of the patients have shown involvement of two or more joints. The most frequent joints affected are the knees

ankles, hips, elbows shoulders wrists, phalanges and spinal articulations

There usually is an effusion into the joint from which the gonococcus frequently can be obtained during the first few days. Later, it is rare that the gonococcus can be demonstrated in the joint fluid.

The degree of involvement may vary from a periarthritis with little or no swelling, to a serofibrinous or suppurative effusion within the joint capsule. At times there is a serous effusion within the capsule, the so-called hydrarthrosis giving but few symptoms aside from the swelling itself More often there is a true arthritis associated with painful swelling There may be suppuration with considerable destruction of the joint surfaces. In all of the cases of true arthritis there is a tendency toward the formation of adhesions if passive motion is not secured from time to time, while true ankylosis is more often an aftermath of suppurative processes.

The painful heel due to spur formation on the os calcis as the result of a localized periostitis is now known to be due more often to things other than gonorrhea. Its common name gonorrheal heel is a decidedly unfortunate misnomer

Diagnosis—As a rule the diagnosis of acute gonorrheal arthritis presents little difficulty The occurrence of painful swelling of one or more joints during a course of treatment for urogenital gonorrhea generally leaves little question in the attendant's mind In the less fulminant cases there may be much doubt regarding the true nature of the joint involvement a doubt that may require much study before the true etiology of the condition is determined. This is particularly true of those cases occurring in patients whose gonococcal infection is difficult of demonstration

There is little room for doubt regarding the fact that many cases have been considered erroneously as victims of this form of arthritis Much of this has been due to too great a readiness to assume that an arthritis is gonorrheal just because there is a history of a more or less remote attack of that disease A little more care in history taking often will reveal that there was an attack of arthritis antedating the attack of gonorrhea It seems not to be generally known that patients who have had nongonorrheal arthritis before frequently have a recurrence of it during an

attack of gonorrhea. The author is a firm disbeliever in the idea that the gonococcus can linger about the male urogenital tract for years without giving the patient unquestionable proof that there is an infection. For this reason he has gone carefully into the histories of patients presenting themselves with a supposed gonorrheal arthritis and rather frequently has had to come to the conclusion that the joint inflammation was due to other causes. One case in point was that of a patient who presented himself during an attack of gonorrhea with multiple painful joint swellings. The history revealed that he had had many such seizures since an attack of gonorrhea some years before and had spent months at a time in hospitals in various cities under a diagnosis of gonorrheal rheumatism. There however had been one severe attack of arthritis before his first gonorrheal experience. Inspection of his mouth showed marked gingival infection of both the upper and lower jaws. He was referred to a dentist with the warning that attention should not be given to more than half of one jaw at a sitting because of a probable high degree of sensitiveness. Even this warning was not enough as, upon the following day he had an extremely fulminant flare-up of the involved joints which kept him confined to bed for several months. It would have been safer not to have touched the gums until he had recovered from the existing arthritis. While this is the most dramatic case of focal infective arthritis stirred to activity by an attack of gonorrhea seen by the author there have been enough others to convince him of the great need for a more careful study of such cases before concluding that the sole cause is metastatic gonorrhea.

Unfortunately the lack of reliability of the gonococcus complement fixation test is such that too great a reliance cannot be placed upon it in the differential diagnosis between gonococcal arthritis and other forms. Even in the best of hands this test carries a disturbing number of false positive results.

Acute rheumatic fever usually can be differentiated from that due to gonorrhea by the fact that it moves from joint to joint without leaving symptoms in the previously affected joints. Though gonorrhea may go from one joint to another there is no rapid subsidence of symptoms in the joints first involved. The temperature

range of acute rheumatic fever is usually far higher than is that of the gonorrheal variety

Symptoms—Upon the rarest of occasions, the onset of gonococcal arthritis is sudden and associated with a chill and high temperature. As a rule, however the condition starts with stiffness, soreness and slight reddening of the skin The joint area begins to swell, becomes tender to the touch and painful on the slightest motion Usually there is an elevation of temperature, which seldom goes above 102 F In the larger joints, particularly the knee, the swelling becomes pronounced and fluctuation can be elicited. In the milder cases swelling and tenderness are less pronounced and there is less pain on motion.

If suppuration occurs the joint becomes red and tense, the temperature reaches greater heights and all of the systemic symptoms are increased. Unless the joint is drained it may rupture through the capsule and skin Skin eruptions are not uncommon in the most severe cases of gonorrheal arthritis

Prognosis—The prognosis depends upon the efficacy of the treatment, the care of the joint in the prevention of adhesions and whether or not suppuration takes place Patients rarely die of this complication but upon rare occasions there develop infection of the heart valves and septicemia. A varying percentage fail to regain complete function of the joint This is particularly true of those joints wherein suppuration has occurred in which permanent ankylosis is not altogether uncommon. Fortunately our present plans of treatment offer a far better outlook for those who develop arthritis and the statistics of the future probably will render the older ones obsolete

Treatment—While there are not to date many data regarding the action of sulfanilamide upon gonorrheal arthritis there is enough to suggest that it should be tried whenever there are not *direct contraindications to its use*

That prolonged hyperthermia fills a long felt want in the treatment of these unfortunates is shown by a large number of workers. Bierman and Levenson[1] treated 16 cases not improved by other methods by raising body temperature to 105.5 F (mouth) in a hot bath and maintaining it at this level in a light frame The

[1] Am J M Sc 191: 55 1936.

pelvic temperature was concurrently raised to 111° F by diathermy The average number of treatments for females was 2 1 and for males 3 5 Of the 16 patients, 13 were cured, 1 was improved and 2 with ankylosis were not benefited. Simpson,[1] by the use of the Kettering hypertherm treated 31 cases with an ultimate improvement of 99 7 per cent and 14 chronic cases with an average improvement of 92.8 per cent over that present at the beginning of the treatments.

Schabel and Fetter [2] using the Kettering apparatus and a temperature of from 106 to 106.8 F reported the following results Acute, 70 cases with a total average of twenty-one hours treatment per patient in 3 or 4 sessions—cured 48 markedly improved 16 moderate improvement 6 Chronic, 23 cases with a total average of twenty three and five-tenths hours treatment in 4 sessions—cured 6 marked improvement 9 moderate improvement 8 cases.

Troutman Stroupe and Devlin (on page 48 of the same issue) used the Kettering hypertherm and a temperature of from 106 to 107 F for five hours on alternate days for varying numbers of treatments with the following results Acute 37 cases—marked improvement or recovery 83 7 per cent moderate improvement 16.2 per cent. Chronic, 24 cases—marked improvement or recovery 54 1 per cent, moderate improvement 25 per cent, slight and no improvement 20.9 per cent.

It would seem from the above reports that, if rapid improvement is not brought about in the first days of sulfanilamide administration, prolonged hyperthermia is the method of choice in all patients physically fitted to endure the ordeal Certainly no treatment yet devised holds out such promise for these sufferers.

When these two methods of treatment fail, or cannot be used for one reason or another one is compelled to fall back upon the older methods that have been so lacking in brilliance, so far as quick recovery is concerned. These have consisted largely of immobilization of the joints either by splints or casts during the acute stage with later massage heat, passive motion to prevent adhesions, and mild or severe protein shock At the beginning of

[1] Brit. J Ven. Dis 12: 133 1936.
[2] Am. J Syph Gonor & Ven Dis 22: 39 1938

an attack the administration of small doses (not over 50,000 000 gonococci) of vaccines on alternate days for not more than 3 doses, at times will abort involvements in the smaller joints. It is probable that large doses of the biologic preparations are more of a menace than a help Such patients have a decidedly narrow threshold of toxin tolerance and are easily overwhelmed to the extent that they exert no curative influences for weeks after this has taken place

Some have claimed benefit from the use of foreign proteins in the form of sterile milk or typhoid vaccine Others have suggested the "intramuscular injection of 10, 20 or even 50 cc. of fluid drawn from the joint every three or four days" (Harrison)

Perhaps of greatest comfort to the patient is rest and immobilization with slight extension Keyes favors a massive plaster cast and finds that it stops pain immediately and renders narcotics unnecessary He advises that it remain on for two weeks be removed for "inspection passive motion, massage and baking and after two days reapplied for another two weeks and so on until the infection is cured '

The importance of caring for the original focus of gonorrhea can hardly be stressed too strongly as there is much reason to believe that it acts as a toxic focus exerting its influence upon the highly sensitized joints. At least it is not uncommon to see patients make no improvement whatever until a badly infected prostate gland is massaged at regular intervals. Such a gland should be handled with the utmost gentleness to avoid undue joint reactions with resultant harm In such cases prostatic massage aside from the promotion of drainage is a virtual autovaccination. There can be no question regarding its forcing of toxins into the blood stream and if too much pressure is applied more harm than good follows. Such massage with possible gentle stripping of the seminal vesicles should be carried out every three or four days unless it makes the patient worse. If it does the unfavorable change denotes too firm a massage or the fact that the patient is far too highly sensitized to stand even slight increases of toxin. In other words the pressure of massage must be viewed from the standpoints of toxin dosage and toxin tolerance and one may find it best to skip treatments if the previous one gave too marked a

joint reaction. The patient does far better on a subreaction "dosage" than if each massage produces a reaction.

No matter what the form of treatment be, it is highly important that adhesions be prevented by passive motion from time to time. Joints swollen to a high degree of tenseness should be aspirated under the most aseptic of precautions, and those that become suppurative had best be drained

Comfort often is to be increased in the subsiding stages and resolution hastened with heat by means of a tent containing a single lamp hydrotherapy and careful massage.

XXXVII. GONORRHEAL PROCTITIS

THOUGH largely a disease of the female, there occur among those addicted to rectal coitus enough cases of gonorrhea of the rectum particularly in detention institutions to make it a matter of importance even in the male. The disease is extremely rare in the individuals who follow normal sex outlets and when present usually can be traced to the introduction of a gonococcus-carrying instrument or finger into the rectum. The writer recently saw a patient whose only possibility for infection was the unsterilized glove picked from the wash basin of a physician carrying out a prostatic massage.

Indeed the histologic and anatomic structure of the anus is such as to offer almost an insuperable obstacle to the unaided passage of the gonococcus from the anal margin to beyond the anorectal line. And it is highly improbable that it can make such a journey Not only is the anal canal for some distance in the grasp of a tonically contracted sphincter but it is throughout its extent, lined by many layers of squamous epithelial cells which it is probable that the gonococcus never could penetrate. That it makes this transit so commonly in the female casts definite suspicion upon such things as the enema nozzle the rectal thermometer and the examining finger of the physician. Indeed, N A. Nelson, after studying many outbreaks of gonorrheal vulvovaginitis and proctitis in the Massachusetts hospitals sweepingly condemns the common rectal thermometer insisting that a different or properly sterilized one should be used for each child H E. Bacon, after much study of the etiology of gonorrheal proctitis is equally insistent upon such a preventive measure as well as directing attention to the rôle of the enema nozzle

In other words, there is every reason to believe that gonorrheal involvement of the rectum is the most easily avoidable of all of the extensions of the disease That it is common in women and children stresses the great need for proper instruction to those of the former who have urogenital gonorrhea to the end that they

avoid the introduction of things into the rectum at least during the period of active vaginal discharge And it places upon those who care for children with vulvovaginitis the urgent need for the same avoidance Certainly, where rectal thermometers are used in such children, they should be sterile thermometers and every care should be taken to cleanse the anal opening before they are introduced. There is also some need that those who care for gonorrhea in the male employ a less dangerous mode of procedure than occasionally holds

Pathology.—If one were to reason by analogy with most structures susceptible to infection by the gonococcus he would be led to the suspicion that the rectum itself would be highly refractory to such infection and his mind would turn to the anorectal crypts as the most likely sites of much of the trouble. For these glandular tubules should be ideal locations for gonococcal infection and one should expect in them when infected, the degree of chronicity that is so characteristic of this malady That these crypts are infected has been shown by a number of workers. According to Rosser (cited by Bacon) "the anal crypts serve as reservoirs of infection as shown by drainage of free pus from their mouths."

The glands of Lieberkühn of the rectal mucosa are structures much like the urethral glands and, in the absence of direct trauma, rarely should play an active part in the production of chronicity of infection if indeed they share in it. They are placed in the mucosa of a highly flexible surface which is subjected to considerable muscular contraction to favor drainage. It is possible that the impact of hard fecal masses could traumatize their openings sufficiently during the stage of active inflammation to cause partial obstruction with its resultant poorer drainage The protective mucous coating of the surface in all probability greatly reduces trauma from this source however

According to Bacon[1] "Usually only the lower three inches of the rectum are involved although the process may extend upward to the sigmoid colon. Ordinarily the mucosa is acutely inflamed, edematous and dark red in color yet in some cases only slight congestion is noted. Smeared over the surface of the mucous

[1] Anus, Rectum and Sigmoid Colon, J B Lippincott Co., Philadelphia, 1938.

membrane is a thick creamy pus possessing a pungent odor Should the process become chronic, which occurs in neglected cases, ulceration, scarring and polypoid excrescences or mammillations appear

Though stricture of the rectum has been ascribed to gonorrhea it is probable that this rarely is the case, if ever In some cases abscesses of the anal crypts occur which may lead to fistula formation It is probable that true infection of the anal canal itself does not occur, though it frequently is in a highly irritated state from the escape of purulent products. While arthritis has been given as a complication, it is just as likely that such lesions are due more commonly to the usually associated urogenital infection.

Symptoms —As with gonorrhea in other regions, the symptoms vary greatly in severity in different patients. Some experience but a slight sensation of rectal irritation while others have symptoms of a decidedly distressing nature. In those cases with the more pronounced symptoms there occur pain on defecation a feeling of fullness in the rectum constant desire to empty the bowel with tenesmus after the act. There may be a rise in temperature and marked malaise Anal irritation, with the escape of much pus which may be bloody is not uncommon At times this causes much excoriation of the anal margin and fissures are by no means rare

Diagnosis —The diagnosis of rectal gonorrhea usually is easily made, for it rarely is difficult to demonstrate the gonococcus microscopically Early in the disease smears taken from the rectal mucosa usually are sufficient. Later, it is best to obtain these from the anorectal line It occasionally is necessary to obtain the material for study directly from an anal crypt. Though the best instrument for use in obtaining spreads for study is the proctoscope one usually can do just as well with the urethral endoscope. It is wise to obtain secretion from about 2 inches above the anorectal line and, also just at this point

In studying such spreads it is imperative that the Gram stain be employed and that only typical intracellular organisms be considered as safely diagnostic. Extracellular gram negative diplococci in the rectum are extremely common At least 10 per cent of rectal smears show gram positive intracellular diplococci that

cannot possibly be differentiated from the gonococcus morphologically Thus, if one uses methylene blue alone for staining he starts with a definitely high margin of diagnostic error Indeed it is probable that the reason why some clinicians report an inordinately high percentage of rectal involvements is that they rely upon a single stain rather than the Gram method.

Treatment—As with gonorrhea in other regions, the treatment of rectal gonorrhea should be utterly lacking in traumatic possibilities and no substances of a highly irritating nature should be used. The call for cleansing and mild mucosal stimulation is the same here as elsewhere. The writer knows of no data upon the efficacy of sulfanilamide in this phase of gonorrhea but there is little reason to believe it would not be of benefit in some cases.

The careful use of enemas of 1 8000 potassium permanganate salt solution, or boric acid at a temperature of 110 F is of definite value. The introduction into the rectum of 1 ounce of either 5 per cent mild protein silver or 0 5 per cent strong protein silver once a day during the acute stage is highly beneficial. One however should not lose sight of the fact that the rectal mucous membrane is an absorbing surface and that there is a possibility that the prolonged use of these substances may produce argyria. The writer knows of no such case but he has seen several as the result of using argyrol in the nose over long periods of time.

The feces should be kept soft by the use of mineral oil and too much roughage in the diet should be carefully avoided Hot hip baths often give relief and seem to hasten cure in some cases Bacon advises the treatment of erosions by the topical application of 10 per cent silver nitrate through a proctoscope.

In the stage of chronicity attention should be directed to the anal crypts as the probable residual foci. These should be injected when possible with 5 per cent mild silver protein several times a week by means of a probe-pointed needle with a reverse curve. It probably is better to destroy the crypts by passing a bent wire into them and fulgurating their channels. Crypt abscess should be incised and fistulae, if present, left for later attention.

XXXVIII. GONOCOCCAL SEPTICEMIA AND ENDOCARDITIS

THAT gonococci get into the blood streams of many patients is shown by the frequency with which many of the metastatic lesions occur That they rarely thrive in this fluid is obvious from the decided rarity of gonococcal septicemia. For this grave condition does not take place in more than one out of many thousands of patients with gonorrhea. It is of course, possible that a good proportion of cases are not discovered the conditions being considered due to the much more easily demonstrated bacteria that at times accompany the gonococcus as a mixed infection, notably the streptococcus the staphylococcus and the colon bacillus. Allowing for such possible errors, however, the complication still must be one of the rarest ones of the disease. That it is rare, in view of the number of times the gonococcus gains access to the blood stream and produces metastatic complications, would suggest that most, if not all cases of gonococcemia have gonococci constantly poured into the blood from some feeding focus, rather than that the germs reproduce in such numbers in the blood independent of such a feeder Indeed, the frequency with which the condition under discussion is associated with cardiac valvular involvements would further suggest such to be the case Recent studies have brought out this common association It is possible that closer inspection of the heart valves would have led many of the earlier reporters of this grave complication away from the local abscesses they viewed as continued feeding foci to a bacterial location offering far freer communication with the blood stream. In fact, many of these earlier students of the subject did discover valvular lesions as well. While it is apparent that some cases of gonococcal septicemia do not have true valvular lesions it has been shown that most of them do

Etiology—The primary focus from which the blood obtains its gonococci is almost invariably in the urogenital tract. And as is the case with arthritis and other metastatic complications, some form of local trauma usually is the precipitating cause

Strangely enough most cases of septicemia occur in the chronic stages of the disease, often when urogenital infection may be extremely difficult of diagnosis. In some cases the primary focus has been a large or small abscess cavity in the prostate gland. In the female, childbirth and pregnancy seem to have been the most common precipitating factors.

Pathology—Aside from the urogenital infection and the presence of gonococci in the blood stream, together with a high leukocyte count, there may be no pathology demonstrable. More often, however there are lesions of the heart valves. Thayer some years ago reported upon 14 cases of gonococcal endocarditis as showing valvular lesions located as follows

Aortic	7
Mitral	2
Aortic and mitral	2
Tricuspid	1
Pulmonary	2

In a recent article[1] Williams reports the lesions of 10 cases as being in the following locations

Mitral	5
Aortic	4
Aortic and mitral	1

Fatal cases usually show an enlargement of the spleen and liver and a glomerular nephritis. There also may be areas of focal necrosis or miliary abscesses in the heart muscle itself

Symptoms—The clinical picture usually is that of other septic conditions and its cause only becomes evident as the result of the suggestive history and the finding of gonococci in cultures from the blood stream. Commonly there is an initial chill. Other cases may start with malaise nausea and vomiting and an elevation in temperature. This temperature elevation may be marked and fluctuating or it may be slight with little daily change Sweating usually is marked arthritic involvements are common and delirium and coma by no means rare. Frequently there appears an eruption polymorphic in character and disappearing upon pressure, on the trunk thighs and extremities. The leukocyte count is from 12,000 to 25,000 or over Diarrhea is common.

[1] Arch Int Med 61 26, 1938

Diagnosis.—The diagnosis of gonococcal septicemia depends solely upon the isolation by culture of the gonococcus from the blood stream, and it is wise to carry out such a study in every gonorrheal patient having a prolonged temperature rise. Possible exceptions may be made in those patients whose temperature elevations obviously are due to such complications as epididymitis, acute prostatitis and prostatic abscess though even in them it often may be a wise course to pursue. It should be borne in mind that most cases of blood infection occur during moderately quiescent stages of the urogenital infection and that a tentative diagnosis of such things as influenza, typhoid or other febrile maladies may be fatal to the patient.

Prognosis.—The prognosis of gonococcemia either with or without endocarditis has always been a grave one, particularly in the presence of severe toxic symptoms Some of the milder cases recovered, but very few of the severer ones survived. Apparently the introduction of sulfanilamide and prolonged hyperthermia bids fair to alter the older prognosis for a number of recoveries have been reported from prolonged fever and favorable reports are beginning to appear as the result of sulfanilamide therapy

Treatment.—Seemingly modern advancement has carried us beyond the older expectant methods of treatment for this serious complication One should resort immediately to either sulfanilamide prolonged hyperthermia or both just as soon as a diagnosis is made. To temporize with so commonly fatal a disease manifestation is to run grave risk of disaster When conditions are such as to allow it, attention should be directed toward the cure of the initial focus of infection as recurrences have been reported in many patients.

XXXIX. MENINGITIS

From a review of the recent writings upon the subject, it would appear that gonococcal meningitis, though rare, is by no means so much so as heretofore was concluded. From the type bacteriologic studies that must be carried out to differentiate the gonococcus from its fellow Neisseria, the meningococcus some cases undoubtedly have been and are overlooked. Studies by Branham Mitchell and Brainin[1] would tend to prove this to be the case. Out of 500 cultures received by these workers to be typed as meningococci during a period of two years, 10 proved to be gonococci. Such a high incidence of gonococci comes as a distinct surprise to those of us who hardly had given the subject any consideration whatever Most surely it brings the matter to a point where it deserves careful consideration in every case of supposed meningococcal meningitis.

Etiology—While the above writers report the case of a virgin in whom no evidences of urogenital exposure or infection could be revealed, all of the other reported cases have been in adults known to have or recently to have had the disease and in infants infected at birth.

Diagnosis—The diagnosis consists of the discovery of the gonococcus in the spinal fluid and demands the most careful of studies to differentiate it from the far more commonly encountered meningococcus. The presence of gonorrhea elsewhere should suggest such studies in all those having meningeal symptoms.

Symptoms—The most usual presenting symptoms are lassitude, headache and elevation of temperature. Later there appear stiffness of the neck and back, occasionally to the point of virtual opisthotonos nausea and vomiting The spinal fluid is hazy from a high cell content and many of the cells contain gram-negative intracellular diplococci The blood leukocyte count is high. The mind usually is clear

Treatment—Both the above writers and Marvin and Wilkinson[2] report prompt relief of symptoms and cure from sulfanilamide medication. Headache is much relieved by spinal tappings

[1] J.A.M.A. 110: 1804 1938 [2] J.A.M.A. 110: 800, 1938.

XL. KERATODERMIA BLENORRHAGICUM

(Gonorrheal Hyperkeratosis)

WHILE there have been described many cutaneous lesions due to gonorrheal infection, the most striking of all of those described is the condition bearing the above titles The occurrence of vari ous erythematous, urticarial and hemorrhagic lesions, mostly con



Fig. 87—Gonorrheal keratodermia. (Courtesy of Dr A M Davidson, Winnipeg, Canada)

fined to the trunk is common in severe cases of gonorrheal ar thritis and is practically the rule in the presence of gonococcal septicemia. Keratodermia blenorrhagicum is far less common and is found most usually in patients presenting few symptoms of the disease though it at times appears during the course of

arthritis. The lesions almost entirely are confined to the legs and feet rarely being found in other locations, and then, mostly on the hands. Largely they occur during chronic stages of the urogenital infection and, singularly enough hardly ever during a first attack. Seemingly, these lesions are far more common in England and on the Continent than in this country

Pathology—Beginning as small red vesicular excrescences, there soon develops a hard central crust formation This crust formation gradually increases in size and thickness and may reach a diameter of 2 cm or more. There builds up a thick rupia like mountain of brown color While a few claim to have isolated the gonococcus from the lesions such efforts usually have been fruitless. The markedly symmetrical location of the lesions upon opposite sides bespeaks a trophic etiology In fact, such a cause has been assumed by most students of the subject. The intervening skin frequently becomes greatly thickened L. W Harrison states that pressure by the finger upon the nodules gives "the feeling as if one were pressing on a blister which had lost its contents but retained its shape by virtue of the rigidity of its celluloid like covering" He further states that, "After lasting for some weeks or months the thickened epidermis of the affected area is cast off in large pieces so that the whole plantar covering may be shed in one or two tough casts of the sole or heel."

Treatment—The treatment is that of the causal infection. Rapid cures have been reported recently from the use of both sulfanilamide and prolonged hyperthermia. No matter what is done attention should be given to the urogenital infection.

XLI GONORRHEAL OPHTHALMIA

THOUGH the incidence of this unfortunate gonococcal implantation has been reduced greatly by prophylactic measures employed immediately after birth, it is still a major problem The reduction of gonorrhea as a cause of blindness in children in this country from the older figure of 28 per cent to the present one of around 7 per cent is a feat of preventive medicine of no small proportions. For it mankind owes to Credé a debt of honor that probably never can be cancelled. But, in the glory of it all that remaining 7 per cent continues to be quite a sizable blot upon the records of those who deliver babies There are those who remove all blame for failure from the method itself and place it squarely upon the faulty technic by which it rather commonly is applied. Some, notably Lehrfeld, Louis,[1] go even further back and place some of the blame upon those who because of pregnancy fail to treat gonorrhea that is known to be present, leaving a birth canal through which no eye could pass with any degree of safety

Incidence—*In the previously mentioned article by* Lehrfeld which is the record of a survey of the records of six hospitals in Philadelphia wherein prophylaxis is said to have been carried out carefully he found that among 27,873 infants there were 632 cases of ophthalmia (2.2 per cent) and that of these 30 per cent were of gonococcal origin. In contradistinction to this rather depressing survey is the report of Somerville-Large[2] who encountered only 2 cases of ophthalmia among 2701 babies born in one year

Susceptibility—The question that naturally arises when one sees *the above title in a book of this kind is What could* an urologist add to the subject? Perhaps the answer should be, "nothing" but to one interested in the general question of gonococcal infections the eye is an extremely fascinating study It seems to offer a decidedly fertile field for thought a field that

J.A.M.A. 104: 1468 1935
Brit. M J 2: 1143, 1937

appears greatly in need of clarification and one in which we should be able to make use of our knowledge of gonorrhea in other mucous surfaces to rather a good advantage.

When it is considered that so large a percentage of all of the blindness in childhood is due to this disease and that it so commonly spells doom to the adult eye when infected, one begins to sense the importance of adding even the smallest bit to our understanding of it.

As the writer's ophthalmologically untutored mind considers the plans of treatment advised in textbooks for so many years for this saddest of all gonococcal manifestations in the light of his experiences in the treatment of urogenital infections it receives some rather severe shocks. The urologist thinks of the eye as one of the most delicate organs of the human body And when he reads that the oculist dares to use such substances as 1 to 8 per cent silver nitrate 2 to 5 per cent mercurochrome 10 to 20 per cent protargol, 10 to 50 per cent argyrol and 1 to 4000 bichloride of mercury or oxycyanide of mercury he is prone to gasp. He knows what would happen if he tried these substances in the same strengths on the seemingly more rugged urogenital mucous membranes, and he wonders if things that would prevent cure here can produce it in the eye True he finds nothing to quarrel about in the milder forms of treatment usually given the preference but is sure to wonder when he sees mentioned these seeming atrocities

With such things appearing in the books from which the physician is expected to obtain much of his knowledge the student of urogenital gonorrhea is sure to feel that the oculist might find some useful knowledge in other fields—things that rightly interpreted in ophthalmologic values should help him to prevent more blindness than he does. He could find immunologic, histologic and therapeutic analogies in the urologist's field that should be of the greatest value to him.

From an immunologic viewpoint it is obvious that all eyes are not biologically alike. The eye at birth and in early life seems to have no immunity whatever to such infections whereas in later life there apparently is rather a marked degree of it. On the other hand this seeming lack of general adult susceptibility shows racial differences for in some peoples, notably those of Asia

Minor, gonorrheal ophthalmia in adult life is of extremely common occurrence. And in these races it would be interesting to know if the eyes themselves do not differ from those of other peoples. One sees a probable explanation of the lack of resistance in the eyes of these peoples in the fact that mild trachoma in early life is almost the rule among them. Whether this exercises its influence upon the true histology of the conjunctiva or by bringing about some biochemical change of a permanent character would be an interesting question to settle.

As one familiar with the habits of the gonococcus considers this great difference between infantile and adult susceptibility, his mind at once turns to possible histologic differences He knows that the gonococcus is rather particular about the kind of mucous membranes in which it wants to live. And as he studies the text books upon the histology of the eye, he finds constantly mentioned in the descriptions of the adult eye something that he misses entirely in those of the fetal and infantile organ and which gives a seeming answer to his question. He encounters the statement that the adult conjunctiva exhibits a marked cuticular layer, which is nowhere mentioned regarding the conjunctiva in early life. And this carries his mind back to the fact that the mucous membranes of the urethra and its associated channels also lack the cuticular layer which is so constantly a part of other mucous surfaces in the body that are not susceptible to gonococcal infection. He wonders if those adults who do get gonorrheal ophthalmia are not histologic rather than biochemical variants. He finds no other explanation. The fact that individuals obtaining their gonococci from the same source have all types of gonorrhea ranging from the mildest to the most severe has shaken his faith in the idea that such things are due to differing degrees of virulence in the gonococci themselves The differences apparently are in their victims

Aside from the protection against gonococcal infections offered by the cuticular layer the urologist long has observed the marked immunity shown by squamous epithelial surfaces. In the light of these observations, let us consider the histologic structure of the ocular surfaces and the resistance they should offer to such infections. *We might, in fact dismiss our cuticular layer from*

further consideration by taking the eye that apparently does not have it. We find in the center a cornea composed of many layers of closely packed squamous cells. Entirely surrounding this is a narrow zone of squamous cells and beyond this is the general conjunctiva. Interpreted in terms of gonococcal susceptibility the two first mentioned areas are immune and the last, the conjunctiva, is susceptible. We know urologically that lack of local nourishment, trauma, or prolonged irritation often will cause immune mucous membranes to become temporarily susceptible to gonococcal penetration. We see our best evidence of this in the general bladder wall, which though naturally immune to gonococcal infection, can be rendered susceptible to it by the irritation occasioned by infected residual urine or by direct trauma, particularly if the trauma causes sufficient submucosal infiltration to reduce surface nourishment.

In the eye we observe that the cornea obtains its nourishment from the circumcorneal zone, which is itself covered by a non-susceptible type of cells. It, therefore, is obvious that there are two ways in which corneal nourishment can be interfered with, viz. direct chemical or mechanical trauma to its surface and any thing that can cause submucosal infiltration or swelling of the circumcorneal zone. When we interfere with corneal nourishment we reduce or obliterate corneal immunity to gonococcal infection. And, as corneal involvement is the one thing that gives us great concern in such eye infections, it is obvious that all of our efforts should be aimed at its prevention

Prophylaxis —The immense value of prophylactic measures against gonococcal infections of the conjunctival sac stands without question. To it alone is to be attributed the great reduction in the numbers of such misfortunes. As has been said, the responsibility for a continued rôle of gonorrhea in the production of 7 per cent of blindness probably is to be attributed to the method of its use rather than the procedure itself

One who has tried to drop solutions into the eyes of the new born would not expect it to be done with an equal degree of thoroughness by all of those whose legal and moral duty it is to do so. Beyond a doubt we always shall have some cases of gonorrheal ophthalmia with us, but if a little more attention were paid

to the technic of prophylaxis in the newborn its present highly depressing incidence could be reduced greatly

Lehrfeld raises a direct question about the efficiency of the Credé method, while Somerville Large states that he has never seen a serious infection of the conjunctiva in a case wherein such prophylaxis was carried out properly Even the two cases that he reports in his series of 2701 childbirths do much to bear this out, as both responded promptly to local treatment and had no discharge from the eyes after four days of treatment. So insistent is this writer upon the safety of 1 per cent silver nitrate solution in the conjunctival sac, that he states that he has never observed eye damage from it. He further warns against experimentation with other things when this in his opinion, is all that could be desired.

Most procedures of the kind fail to reach the point of maximum value because of failure to do some simple little thing, and one who has delivered many babies or who has watched the doing of the Credé method readily can sense what the simple thing is in this connection. There are few seemingly easy things more difficult to do than really opening the eyelids of a newborn baby still covered with the lubricant with which Nature covered it to help in its passage through the birth canal. A greased pig almost is covered with sandpaper as compared with the child when it first finds it has a voice. The writer himself has tried to open the eyes of infants at this time to apply prophylaxis and he has seen many others do the same thing What silver nitrate really entered the sac, if any did was certainly not distributed widely enough to prevent gonococcal infection. Undoubtedly the simple thing that stands in the way of far greater success is that, as often as not, the skin is not cleared of Nature's lubricant before the effort at prophylaxis is made It is a much easier task to open eyelids that have been wiped carefully with sterile gauze

The laws of most states call for the use of 1 or 2 per cent silver nitrate solution as a prophylactic There can be little doubt about the lesser strength's being of equal efficiency and far more safety than the stronger

So far as the prevention of gonococcal infection of the adult eye is concerned one should not bank upon the fact that but few

adult eyes in this country are susceptible to such infection. Such things commonly occur where they are least expected and their prevention is largely a matter of impressing the patient with the overwhelming importance of washing his hands with a good soap lather immediately after each handling of infected parts or dressings. Such instruction, and the insistence upon its being carried out, are not always so easy with young children having gonorrheal vulvovaginitis, but those who care for them should be instructed to bend *every effort toward seeing that the precaution is followed.*

As is pointed out elsewhere the introduction of sulfanilamide into the treatment of gonorrhea has injected another hazard for the children yet to be born. Not only are a varying percentage of both sexes made symptomless carriers thereby but it is much in evidence that many women infected by men seemingly cured by this drug have absolutely no symptoms suggesting that they have been infected They become asymptomatic gonococcus carriers from the start. Confined so largely to the childbearing age as this disease is, one needs no gift of second sight to sense the imperative need for the most careful prophylactic measures no matter how sure the physician may be that there is no gonorrhea in the family Assuredly the set up is a serious one and it will be interesting to see what part it may play in increasing the incidence of ophthalmia neonatorum in the years to come.

Treatment—When one familiar with the behavior of urethral gonorrhea when treated by moderately strong solutions of germicides views the array of local treatments suggested for gonococcal infection of the conjunctiva, he is prone to shiver At least as has been said, he is sure to wonder how strengths of solutions that literally would wreck the urethra could be curative in what seems to him a far more sensitive structure the eye To him it would look like sacrificing safety for a hoped for speed of recovery He would find it extremely difficult to understand why the cure of *urethral gonorrhea depends so much on the stimulation of curative* processes by things almost devoid of active bactericidal power and that that of the eye depends upon the direct killing of gonococci. His great wonder would be how any cornea escaped surface change that would allow of gonococcal penetration and how with a circumcorneal zone thus treated enough blood could go through

it to nourish the cornea and prevent bacterial penetration beneath its surface

By the nature of things he would find himself greatly admiring the attitude of those gentler ophthalmologists who lean toward such things as cleansing washes cold applications and local tissue stimulation of a milder nature He would draw his high line at 1 per cent for strong protein silver and 5 per cent for the milder salts. He would pin his hopes on a seeing eye rather than the gaining of a few days.

While those newer additions to our therapeutic armamentarium prolonged hyperthermia and sulfanilamide, are being reported as of great value in the treatment of gonorrheal ophthalmia, it is probable that most such infections in the first weeks of life will continue to be treated by local measures for some time to come. Most physicians would hesitate to give so uncertain a drug as sulfanilamide to such young children and every one should indulge in even more consideration before subjecting them to prolonged hyperthermia. Most of the reported work along these lines has had to do with adults where dangers usually are far less and, considering the possible outcome of the condition in them, one rarely should hesitate greatly because the methods may have dangerous possibilities.

Regarding hyperthermia in the treatment of this condition F J Pinkerton[1] reported upon the treatment of 3 adults. Before the treatment they all had a profuse discharge of pus from their eyes These discharges had disappeared entirely two days after the prolonged temperature elevation. J Terry[2] chronicles the disappearance of both symptoms and gonococci from the eyes of a woman by the third day following such treatment.

Extremely favorable results from the administration of sulfanilamide have been reported and unquestionably it should be given to adults having such an eye infection T Willis[3] has used this drug in 4 cases of ophthalmia neonatorum in conjunction with saline and boric acid washes and cold applications and is of the opinion that it gave more rapid curative results than any treat

Am J Ophth 20: 63 1937
U S Nav M Bull, Oct 1937
Yale J Biol and M 10 209 1938

ment he has tried. He administered between 0.2 and 0.25 Gm. of the drug per kilogram of body weight per day These were di vided into regularly spaced doses during the twenty four hours Close watch was kept on the hemoglobin and transfusions were given if indicated Other drug reactions also were watched for closely

XLII. OTHER COMPLICATIONS

Periurethritis or Spongeitis.—Ordinarily, an attack of gonorrhea does not produce enough periurethral infiltration to limit the distensibility of the corpus spongiosum to any great extent. If, however, there is added to the usual pathology of this disease in the anterior urethra, either by the injection of strong chemical solutions or by direct trauma to the canal from within or without any great amount of infiltration the result is a very different one The corpus spongiosum becomes indurated and loses its power to stretch upon penile erection As a result of this, the penis is curved markedly and great pain is experienced upon even a partial erection Not only this, but there is a far greater likelihood of the later formation of fibrous strictures. Masturbation or coitus in the first few days of the disease are not uncommon causes of the complication.

Treatment.—Obviously the most important part of treatment is prevention, and this is easily done by the avoidance of strong chemical injections urethral instrumentation and proper patient instruction In the presence of marked infiltration of the corpus spongiosum the patient should apply heat either by means of hot hip baths or immersion of the organ in hot water several times a day Only the gentlest types of urethral treatments should be given The bowels should be kept open To avoid erections, he should refrain from heavy eating and stimulating drinks such as coffee before retiring He should sleep on his side and if any difficulty is experienced in this regard some hard object should be tied between his shoulders to prevent his turning on his back while asleep He should arise several times at night to empty his bladder and would do best to sleep on a firm mattress with not too many covers. Should erection occur he should cause its subsidence with cold water

Phimosis.—Even in the presence of a profuse urethral discharge it is rare for patients to have any amount of inflammatory phimosis unless the tissues have been traumatized by masturba-

tion or coitus during the early hours of the infection. This is so whether the preputial opening be large or small and if phimosis occurs in the absence of such early trauma, one usually finds that chancroid was contracted concurrently with the gonorrhea and that there are subpreputial ulcerations present. In the traumatic types of phimosis there commonly is an associated lymphangitis and some painful swelling of the inguinal lymph nodes. There also may be some dorsal phlebitis.

Treatment—In the absence of subpreputial ulcerations the swelling of phimosis usually subsides within a few days as the result of hot water immersions several times a day It is well also to keep the preputial sac cleaned by the injection into it several times a day of 1 8000 potassium permanganate solution

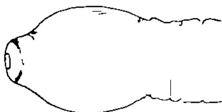


Fig 44.—Inflammatory phimosis due to a narrowed and indurated preputial meatus

Even in the presence of chancroid a few days of this treat ment usually will reduce the swelling sufficiently to allow of suf ficient preputial retraction for a dark field study of the ulcer fluids a thing that never should be neglected however innocent looking may be the lesions. If such treatment does not make dark-field study possible within a few days a dorsal slit is justi fiable for exposure of the sore.

Paraphimosis.—This condition is due to the same causes as phimosis. In it the swollen prepuce forms an enormous collar of edema back of the glans penis and it will not spontaneously come forward. To the patient this is often a more alarming complica tion than phimosis for the distortion of the organ is such as to engender the conviction that the entire penis will be destroyed. If the condition has existed for a number of days there may be such a lack of nourishment of the distal surface of the prepuce that a number of small ulcerations may be present and the former

preputial margin, which has really become the constricting band, may have sloughed in the depths of one of the dorsal creases

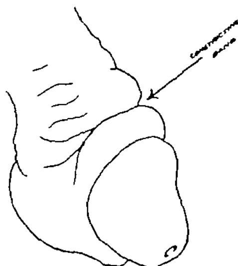


Fig 89 —The penile deformity of paraphimosis.

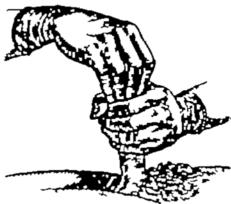


Fig 90 —The author's method of reducing paraphimosis by pressure reduction of edema in both the prepuce and glans before any effort is made to replace them in their proper relations If the pressure is slight at first and then gradually increased the procedure causes little pain even in the presence of ulceration.

Treatment —Whether or not ulceration has taken place it practically always is possible to replace the glans and prepuce in their normal relations without recourse to surgical measures In

order to do this it is necessary to reduce the swelling both of the glans penis and the retracted prepuce. This is done by grasping the glans by the tips of the fingers of one hand while the preputial swelling is encircled by the palm and fingers of the other hand (Fig 90) Prolonged, gentle pressure is made to both structures and it soon will be observed that practically all of the swelling can be reduced even when the preputial edema has assumed quite a marked degree of firmness. The temptation to reduce the paraphimosis before there is sufficient reduction in the swelling to make it an easy painless matter should be resisted if unnecessary trauma and pain would be avoided. When the structures are replaced in their normal positions it is well to pass a strip of adhesive plaster along the sides and over the end of the organ so as partially to obstruct the preputial meatus and prevent a recurrence of the deformity



Fig. 91.—Papillomata of the glans and reflected layer of prepuce (The so-called "venereal warts")

Rubber gloves always should be worn by the physician if there are ulcerations present, and it often is well to cocainize all denudations to obliterate pain. Dark field studies of ulcer fluids should be made.

After the reduction of a paraphimosis heat should be used and any surface changes of the preputial sac should be cared for by washes and mild antiseptic powders.

Balanoposthitis.—Inflammation of the glans penis in the absence of involvement of the apposed layer of the prepuce is so rare in gonorrhea that it is general custom to make use of the compound term denoting both. The condition generally is due to the retention of acrid purulent products beneath a long prepuce It rarely is seen in those who give proper attention to the preputial sac. If the inflammation is not overcome the formation of papillomata (venereal warts) is of common occurrence (Fig. 91)

Treatment.—The treatment of balanoposthitis is mainly local heat and cleanliness. The preputial sac should be washed several times a day with 1 8000 potassium permanganate solution by means of a syringe or irrigator, if there is a phimosis preventing retraction of the prepuce.

In the milder grades where there is no inflammatory phimosis, simple cleansing of the sac several times a day and dusting with boracic acid or any of the milder antiseptic dusting powders usually will bring about prompt cure.

In the presence of destructive ulceration of the glans it at times may be unwise to wait for heat and treatment of the preputial sac to reduce the preputial swelling. It may be really an emergency matter to uncover the glans to prevent further tissue destruction. This may be done in several ways either by dorsal or lateral slitting of the prepuce or by cautery circumcision No matter which is used one may expect infection of the cut surface. There is reason to believe that less destruction follows carefully done cautery circumcision with cauterization of the offending ulceration. Before cauterizing any ulcerations however several specimens of serum from them should be subjected to the most careful dark field studies as an overwhelming number of such ulcerations are mixed infections in which the Treponema pallidum can be found

In the negro at times in the white one frequently encounters in the presence of balanoposthitis a number of small transverse cracklike ulcerations on the preputial margin. These cause considerable pain usually prevent preputial retraction and most commonly are negative to dark field study for the treponema pallidum. If the preputial sac is washed frequently with permanganate of potash solution the organ immersed in hot water and a mild stimulating antiseptic applied to the ulcerations they usually heal slowly but the resultant narrowing of the preputial meatus generally makes later circumcision a wise procedure.

Perhaps the quickest way to heal these marginal ulcerations is by the use of Robbins and Seabury method for the treatment of chancroid It will be recalled that they advised making an application of 25 per cent copper sulfate solution to such ulcers and passing through it high frequency electric sparks by means

of a pointed "vacuum" electrode. This rarely has to be repeated more than two or three times at from two- to four-day intervals.

Folliculitis (Littritis).—It is probable that the glands of Littré become infected in every case of gonorrhea in the male. These structures despite their diminutive size and in the absence of trauma unquestionably have ready drainage possibilities, as a rule. Were the reverse the case, one would find chronicity of infection in every case of specific urethritis For these glands anatomically and histologically are of such size shape and cellular structure that one would expect their infections to behave in a manner similar to those of the endocervical glands and those of Skene. Such however is not the case in any great number of patients, for without treatment aimed directly at them they generally go on to cure along with the urethra.

It is probable that they are slower in recovery than would be the free urethral mucosa, and that it is because of this slowness that anterior urethritis does not respond more promptly to local treatment. The really important factor in our present consideration is that untraumatized, they do clear up without compelling us to destroy them or treat their cavities two things so glibly advised by some devotees of endoscopy and so utterly impossible of real accomplishment.

In certain cases where the urethra has been subjected to direct trauma, either chemical or mechanical this usually free drainage is interfered with by partial or complete obstruction of the gland opening. If conditions are such that the gland drains only from time to time it remains for an indefinite period as a gonococcus feeder to the free mucosal surface and we see a case of chronic gonorrhea that tries the patience of its victim and almost defies the skill of his physician.

If however this urethral trauma causes so much swelling that the gland opening becomes completely closed one of three things happens as previously has been pointed out (1) The lumen of the gland becomes distended, forming a shotty or pealike mass in the corpus spongiosum and after from four to six days it empties into the urethra through its natural opening and disappears. (2) The gland fails to open but goes on to resolution leaving a minute shotlike lump at its former site (3) The infection breaks through

the gland capsule and becomes a true follicular abscess The aftermath of the first may be prompt cure through good drainage or chronicity of infection from intermittent drainage. That of the second is an eventual nodule in which lytic processes have killed the gonococci and it safely can be disregarded. That of



Fig. 92.—Deformity due to follicular abscess. Lateral view

the third is much tissue destruction if not surgically treated and a possibility of later stricture formation under the best treatment.

Treatment —From the foregoing it is obvious that prevention is far better than treatment and one who avoids strenuous forms of local treatment and secures even moderate patient co-operation

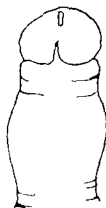


Fig 93.—Deformity due to follicular abscess. Ventral aspect.

does not encounter a swollen urethral follicle in many hundreds of cases. He who uses high-pressure urethral irrigations or early introduces instruments into the urethra is by no means so for tunate.

The treatment of the first and second types of follicular swell ing should be entirely palliative as at least 90 per cent of them

will either empty or undergo resolution on the repeated immersion of the penis in hot water Some advise their intra urethral incision, a thing by no means so simple as it seems. When it is accom plished there usually is left quite a pocket in the urethra which causes a prolonged urethral discharge even after the gonorrhea is cured.

The treatment of true follicular abscess is an entirely different matter If allowed to go until it attaches itself to the penile skin it dissects widely along the under surface of the organ and creates much destruction. It is far better to incise it moderately early In doing this it is wise to make a rather long longitudinal incision down to the abscess itself and then open the pus cavity If a small skin incision is made, it rarely overlies the opening into the abscess when the swelling has subsided and the cavity must drain through a tortuous channel. The wound should be lightly packed to its depths with gauze for the first forty-eight hours to assure a straight opening. After this the gauze should be removed and drainage allowed to proceed. It is safest to avoid all intra urethral treatments during the first four or five days Otherwise the poorly nourished urethral wall may be broken into the abscess cavity and a permanent fistula result.

Parafrenal Abscess (Suppurative Tysonitis) —As was pointed out in the section on anatomy there are two tubular glands one on each side of the frenum emptying into the preputial sac. At times one or both of these glands become infected and when they do abscess formation usually takes place These abscesses appear as round red swellings on their own sides of the frenum (Fig 94) which, if not incised early promptly rupture through an opening too small for proper drainage. Such abscesses frequently are mistaken for follicular abscesses. Occasionally these glands do not go on to abscess formation when infected but remain as poorly draining foci in which gonococci may linger for long periods of time. Unless properly treated these abscesses, after their rupture frequently will harbor the gonococcus indefinitely

Treatment —The initial treatment of parafrenal abscess is surgical opening This is best done by grasping the most prominent part of the abscess by a pair of mouse-tooth forceps and snipping off the top with the scissors The reason for this is that,

even after opening, the deeper portions of the gland frequently will harbor gonococci unless later treatment is carried out. Unless a large opening has been made the gland channel cannot be found when the swelling subsides Daily after the abscess is opened, a small probe-pointed needle should be passed into the depths of the channel and it should be injected with 5 per cent mild protein silver This should be continued until it no longer is possible to express fluid from the canal and it should be carefully watched during the subsequent treatment of the urethral infection. In some cases there occurs a minute opening into the urethra as is shown by the escape of some of the silver protein from the urethral

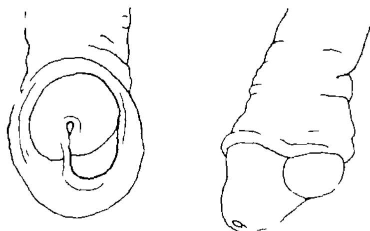


Fig 94—Front and lateral views of deformity due to an abscess of a parafrenal gland

meatus. If this takes place the canal should be treated until it and the *urethra contain no gonococci It is rare for* urine to escape through such a minute sinus in this location.

Upon rare occasions the canal remains as a palpable fibrous cord and gonococci usually can be shown to be present. If so it is safest to dissect it down to the urethral wall ligate the proximal end to prevent a sinus and remove the gland

In view of the possibility of a chronic parafrenal gland infection in the absence of abscess formation it is wise to study this area closely in every patient to avoid leaving untreated an ideal site for prolonged gonococcal stay The writer has seen two such

cases which resulted in the infection of others long after the patient to all appearances was cured

Para-urethral or Juxta-urethral Sinusitis.—Infection of the minute channels that often penetrate the substance of the glans penis and most frequently open upon its surface near the urethral meatus (see Fig. 13) is by no means uncommon. Beyond, perhaps, a slight reddening of the area around their openings and the occasional escape of an almost imperceptible amount of pus, infections of these minute mucous channels give no symptoms It is probable that they never undergo abscess formation. Like the parafrenal glands they harbor gonococci for great lengths of time. They should be searched for carefully in every case of gonorrhea, for if overlooked, they almost certainly cause the infection of others In the previous editions of this book a case was cited of an individual who infected a woman and during treatment for the sinus infection developed an acute urethritis because one of the sinuses had an opening into the urethra also

Among the fairly large number of cases of para urethral sinusitis that have been seen by the writer more than half had transferred infection to others

Treatment—It usually is a simple matter to destroy these channels by the insertion of a small blunt wire and subjecting them to the fulgurating electric current. In the absence of this they can be cured rather promptly by injection of 5 per cent mild protein silver as was advised for the treatment of parafrenal sinusitis. If close to the meatus they can be slit into the urethra. Before doing this, however it is best to carry out the above injections for some days to avoid urethral infection and perhaps, metastatic gonorrhea. The writer once had a patient develop gonorrheal arthritis the day after a sinus was opened into the urethra.

It is unwise to conclude that these minute channels can be destroyed by strong chemicals. Gonococci have been expressed from them after the injection of tincture of iodine and even after they have been ballooned with 50 per cent silver nitrate solution

Lymphangitis and Phlebitis.—These two conditions frequently are coexistent and both are due to direct trauma to the shaft of the penis in the early days of infection They usually

clear up promptly on penile immersion in hot water at short intervals Upon the rarest of occasions small areas of infection occur in the skin which require incision. Usually there is an associated phimosis or paraphimosis and an inguinal adenitis.

Inguinal Adenitis (Gonorrheal Bubo) —In gonorrhea associated with profuse discharge, there usually is some tender, moderately painful swelling of the inguinal lymph nodes for a few days In contradistinction to like lesions caused by chancroidal infections these do not become suppurative After a few days of discomfort they undergo resolution whether treated locally or not.

"Gonorrheal Heel."—As has been said the condition that bears this obviously unfair misnomer probably has nothing whatever to do with gonorrhea. Certainly, just the fact that a man who once had gonorrhea develops a bony spur on his os calcis is no proof of such an etiology The lesion, also, occurs in individuals who have never had that disease. The pain is present only on walking and, generally can be relieved by placing a sponge-rubber pad under the heel with a depression in it to correspond with the position of the spur Occasionally it may be necessary to remove the spur surgically

Pyonephrosis.—There have been reported a number of cases of gonorrheal pyonephrosis. In all of them that have come to the writer's attention there was obstruction along the course of the ureter and it is probable that the conditions were, in reality hydronephrotic ones that later became infected by the gonococcus. The frequency with which ureteral reflux of bladder contents has been demonstrated compels one to believe that, in the absence of ureteral obstruction, the gonococcus probably never gains a foothold in the upper regions of the urinary conducting structure. Otherwise, upper tract gonorrhea would be a moderately frequent lesion a thing that either is not so or we do not make a diagnosis of it when it is present. That it can do so in the presence of obstruction stands without question. Its treatment is that of any other similar pyonephrosis If the obstruction can be relieved there is every reason to believe the gonococcus soon would disappear from the kidney pelvis and ureter

XLIII. NONGONOCOCCAL URETHRAL DISCHARGE

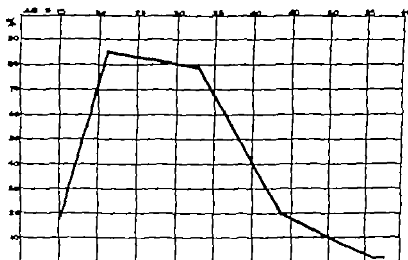
The frequency of urethral discharges that have nothing to do with the presence of the gonococcus is so great as to justify a careful consideration of the condition in a work supposed to confine itself solely to gonorrhea. The rather widespread impression that nongonorrheal discharges are so rare that one almost safely can conclude that the patient having a profuse discharge from the urethra has gonorrhea and the one with a scanty discharge probably has that disease, is in no way borne out by careful studies in the comparative incidences of the two conditions.

In order to settle the incidence question in his own mind as well as to study the number of complications occurring in gonorrheal patients under different treatment forms the writer several years ago culled from his files the histories of patients whose presenting symptom was an urethral discharge. These were selected in the reverse order of their appearance at his office until there were 750 histories of patients having gonorrhea. In this way the histories of those patients whose discharges were not of gonococcal etiology, but who appeared during the same period of time, were taken from the files for study. Though the writer was by no means of the opinion that nongonorrheal discharges were rare, he was surprised greatly at their high incidence. In all 1083 case histories were studied and, of these 333 patients had discharges in the total absence of gonorrhea at the time of study. In other words, just 30.8 per cent of the urethral discharges studied during that time were utterly nonspecific in origin.

The separation of these cases into age groups brought forth some interesting facts that previously had not been suspected by the writer. *It was found that such purulent urethral discharges are rare before eighteen years of age and in the absence of urethral stricture, very rarely occur beyond the age of forty-five years.* As will be seen in Chart XI they are found in just that period of life in which gonorrhea, also is most frequent. The importance of this latter observation is outstanding and gives abso-

CHART XI

AGE INCIDENCE OF NONGONORRHEAL DISCHARGE



lutely no warrant for the assumption that any urethral discharge is of gonococcal origin unless the gonococcus is demonstrated to be present.

Certainly there is no such thing as a typical gonorrheal discharge," nor is there a typical nonspecific discharge. Large numbers of the latter were profuse yellow discharges some were greenish in color and a few were blood-tinged. Though the inclusion of tables that so often contain so many things as to bewilder rather than instruct has been avoided in this work where simplicity has been courted there is so much that is of interest and value in the one compiled from these cases that it is included (Table II) for the study of those who care to go more deeply into the microscopic characters of the discharges as well as the demonstrable causes of most of them There are many surprises to be found therein.

The diagnosis of gonococcal urethritis is a simple matter when compared with that of the nonspecific variety In the former one only has to find the gonococcus. In the latter he must make repeated searches to be sure that the gonococcus is not present and even then often is assailed by doubts lest it be present and he has missed it. The solution of the true cause of a given case of non-

TABLE II

TABULATION OF THE SALIENT POINTS IN THE HISTORIES AND FINDINGS OF PATIENTS WITH NONGONORRHEAL URETHRAL DISCHARGE

Ages	15-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	Totals
Cases	17	85	84	77	45	28	5	2	2	333
Single	15	70	66	40	23	3				217
Pus	15	53	70	56	31	11	3		1	237
Epithelium	3	13	11	14	6	3	1	1		50
Mucus	3	14	10	6	4	5	1	1	1	44
Semen			1		1					2
Previous gonorrhea	8	43	85	47	23	8	4			193
Prostatitis	8	57	61	48	31	14	4	2	2	227
Chancroid	4	10	6		3					24
Idiopathic	3	5	3	6	3	1	1			26
Prophylactic	1	3	2	3	3	2				15
Suspicion of tuberculosis		2		1	2					5
Urethral cysts	3	10	11	7	8					41
Urethral cysts and tuberculosis		3	4	1	1					9
Urethral papilloma		2								2
Hypertrophied prostate								1		1
Focal infective prostatitis	3	8	3	8	9	11	4			43
Vaginal ulcerations			2	1						3
Prostatic abscess		1	1							2
Alcohol				2						2
Stricture		2	5	8			1			24
Cowperitis			5							5
Urethral trauma		1	5	4		2				12
Trichomonas vaginalis			1		1				1	3
Balanoposthitis										1
Pregnant uterine		1				2				3
Intracellular staphylococci				3	8	4				15

specific urethritis offers no such simplicity as is enjoyed in gonorrhea. Though one may find various bacteria present in the stained smear he even then is far from the complete answer and must delve carefully into the patient's history and present pathology in the hope of finding it. Lacking it he is at a great disadvantage for cure so commonly depends upon the removal of the etiologic factors.

In our consideration of the subject, we perhaps should do best to view the urethra as a canal that usually harbors, without harm to itself most of the bacteria that are found in nonspecific inflammations Harboring them normally, as one might say, there must occur some exciting factor to disturb this happy state of affairs, to reduce this rather constant immunity and sensitize the mucosal surfaces to the toxins they have known so long. And it is in the determination of these exciting factors that we find an immediate broadening of the investigative field. Though we usually begin by the determination of the particular micro-organism present in the discharge we err if we let that knowledge occupy too large a place in the picture.

The anterior urethra, for it is this portion of the canal from which the discharge arises is a very well behaved portion of the body under normal conditions. In the absence of an exciting cause it does not produce pus. Further that cause is seldom solely the presence of the bacteria found in the discharge. (The exceptions to this are gonorrhea, chancre, chancroid and tuberculosis, the last three of which are extremely rare, and none of which really should be called 'nonspecific.")

The urethral mucous membrane has the peculiarity of developing a prompt purulent response to almost any type of irritant. The degree and duration of this purulent response depends upon the strength of the irritant and duration of its action. The greater the irritation, the greater and more continued are the evidences of it. If the irritation is not great and is of brief duration the evidences of it as a rule are not great and they rather promptly disappear If mild irritation is often repeated, the resultant discharge may continue over a great period of time. Under this last condition or where the strength of the irritant is almost or completely cauterant a change takes place in the lining cells of the canal. A protective type of epithelium—squamous—replaces the normal columnar cells. There is at times such an over production of squamous cells that they desquamate in large numbers occasioning a discharge that cannot be differentiated macroscopically from pus. If the caliber of the canal is narrowed sufficiently to impede greatly the urinary stream this same pro-

tective type of cells replaces the normal cells immediately proximal to the obstruction.

It safely can be said that a chronic nongonorrheal discharge is due to the continued action of the etiologic or underlying cause and not to the particular bacterial elements present. An unobstructed anterior urethra seldom if ever will hold a chronic inflammation in the absence of some continued exciting factor unless it has been thoroughly devitalized by chemical or instrumental trauma, and, even then, it shows a marked power to correct these results unaided by therapeutic measures.

Regarding the etiologic factors concerned they can be divided into several groups in the order of their frequency (*a*) deeper lying pathology somewhere in the urinary tract (*b*) irritants introduced from without (*c*) idiopathic factors (*d*) foreign bodies in the canal, (*e*) systemic diseases (*f*) parasitic infestations.

Under the heading of 'Chronic Gonorrhea we have discussed most of the underlying pathologic processes in our most common group of causes. Except with the obstructive conditions such as stricture or narrowed external meatus, practically all chronic and most acute discharges under this particular heading are secondary to infections in the smaller mucous channels emptying into some portion of the urethra As by far the greater number of such feeding infections are located in the prostate gland the diagnosis and cure of most of them depend upon the diagnosis and treatment of the underlying prostatitis.

While the discharge occasioned by chronic prostatic infection usually is limited to a drop of pus at the meatus in the morning there are many marked exceptions. The morning discharge of chronic prostatitis frequently is not discovered by the patient until some questionable sexual contact causes him to make a closer inspection of the parts than he usually does. Fright, a guilty conscience or both, cause him to come to the conclusion, upon the discovery of the presence of discharge that he has gonorrhea and immediately to seek his physician Unless the physician studies the discharge carefully the history is prone to lead him to agree with the patient and carry out the treatment and precautions belonging to that disease In such studies it never should be forgotten that gonorrheal discharges at times show so few gonococci

continue to discharge for more than a few days after its removal. Should the trauma be carried to the stage of definite tissue necrosis the discharge naturally would be more prolonged, but even then it usually ceases promptly after the complete healing of the necrotic area.

Urethral discharges due to chemical irritation at times follow efforts at prophylaxis for gonorrhea. They appear within a few hours of the offending injection, and unless the injected substance

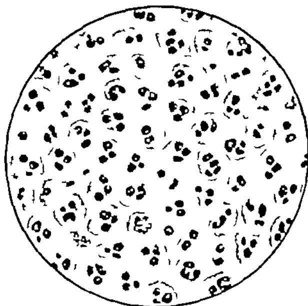


Fig. 97.—Type of discharge commonly seen as the result of chemical irritation of short duration. The absence of bacteria is highly suggestive of such a causal factor

has been almost or quite caustic in its action, they usually will subside promptly without treatment. Should the urethra be subjected to many such insults the discharge can be kept up for great lengths of time. In this latter class as has been cited in the chapter on "The Microscopic Interpretation of Urethral Discharges," there are usually many squamous epithelial cells to suggest the true cause. These discharges are prone to contain many bacteria in contradistinction to the practically nonbacterial discharges occasioned by a single chemical insult.

Of greater interest and perhaps, frequency in this group are those urethral discharges that are caused by contact with irritating vaginal secretions. As such disturbances are most likely to be oc casioned by postmenstrual secretions, and show a rather fixed tendency to disappear promptly, there is commonly almost a fixed cycle to their appearance which helps in the solution of them. They are prone to exhibit a large assortment of bacteria, and, like the suppurations due to chemical irritants, they practically lack an

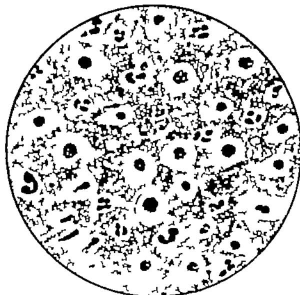


Fig. 98.—The number of squamous cells, the background of bacteria, and the scarcity of leukocytes would suggest old urethral stricture or prolonged urethral devitalization from strong chemicals.

incubation period being present within twelve hours of the ex posure.

Those discharges due to an unclean preputial sac, where every opportunity is afforded for the development of bacterial toxins of a highly irritating character are usually easy of solution and equally easy to cure. In fact, it can be said that the treatment of this entire group of cases is largely prophylactic. Little difficulty is encountered in curing them when the conditions causing them are corrected or avoided They then show a decided tend

ency to disappear spontaneously but their cure commonly can be hastened by the injection of mild solutions of the same kind and in the same way as are used in the treatment of gonorrheal anterior urethritis

The next in frequency are those discharges for which we can elicit no definite etiologic factors. For there occur nonspecific urethral discharges that cannot be explained by our most careful investigations. A large share of the seeming mystery in their origin is to be attributed to a lack of frankness on the part of the patient, but there still remain a considerable number that are not so easily explained Singularly enough, these commonly are the cases in which we experience most difficulty in producing a cure.

Of the rarest occurrence are those urethral discharges that are to be attributed to the presence of a foreign body or to systemic disease. The former are most commonly the result of urinary calculi or broken catheters that have found anterior or posterior urethral lodgment or are occasioned by bodies introduced for purposes of masturbation

Before we knew so much about the rôle of deeper pathology in the production of urethral discharge we heard more about discharges due to some particular systemic diathesis." There is considerable question about the occurrence of urethral discharges as the direct and sole result of systemic disease A close study of the lower urogenital tract will reveal a more plausible explanation in the shape of local pathology in almost every case

One might add with some reason an ingestive type of urethritis, for there are encountered upon rare occasions individuals with apparently normal lower tracts who will experience a scanty urethral discharge on the morning following the ingestion of much alcohol The older writers also mentioned asparagus rhubarb turpentine cantharides arsenic and potassium iodide as possible causes of an urethral discharge but they must be of the rarest occurrence if indeed they ever do take place

Studies within the last few years have shown that infestation of the lower urogenital tract by the Trichomonas vaginalis is by no means so rare as formerly was supposed Upon rare occasions this infestation may be confined to the anterior urethra alone. More often the prostate is infested. The diagnosis of this in

festation is by no means a difficult one. Not only is it possible to find the parasite in active motion in the prostatic secretion but it can be seen in the urinary sediment as well. For some unknown reason, it is not commonly observed in the fresh urethral secretion, though this fluid usually is of a thin, mucoid character Owing to its assumption of a perfectly round shape on drying it is almost impossible to differentiate it from cells commonly found in such fluids, when stained. Once recognized in fresh secretions it does not escape detection very often thereafter

So far the discussion has been confined to those patients who present themselves to the physician with an urethral discharge present at the time. It has not been intended to include that rather large number of patients who visit the physician stating that they have such a discharge but have none present at that particular time He who treats such patients on the strength of history alone is courting the chagrin that so often arrives. The number of such patients whose so-called discharge' is solely an increase in normal urethral mucus is great. Such patients need education and not local treatment Many patients receive prolonged courses of treatment for a "discharge' the nature of which easily could be determined by a knowledge of the time and cause of its appearance and the finding of a normal prostatic secretion Not a few individuals who have not had sexual relief for some time, force out prostatic secretion or even, seminal fluid when straining at stool. When informed what its cause is most individuals either step up their sex outlets or pay no further attention to the "discharge." If neurotically inclined they commonly continue to worry about the matter and it is justifiable for the physician to carry out a course of prostatic massage to keep the gland moderately well drained for a while. Often the better muscular tone of the gland following such a course of treatments prevents the accumulation of so much prostatic secretion and banishes the symptom thereafter

It always is wisest to furnish the patient complaining of urethral discharge but who has none at the time of his visit with slides for the making of spreads More often than not when these spreads are studied microscopically nothing is found but normal urethral mucus

Treatment.—The treatment of nonspecific urethral discharge predominantly is that of the removal of its underlying cause. Local chemical treatment of those cases resulting from deeper pathology in the tract seldom is permanently curative. It, at times, may stop the discharge but recurrences are so nearly the rule as to make it of little, if any, real value to the patient. As the treatment of this pathology has been considered elsewhere, there is little need for its repetition here

If no deeper lying pathology exists, most such discharges can be cured quickly by the use of the local treatment advised for acute anterior urethritis of gonococcal origin Upon rare occasions and particularly in those having an idiopathic mucoid discharge the injection into the anterior urethra of an astringent will check the discharge promptly One should study such cases carefully for the Trichomonas vaginalis however, before concluding that they justly belong in that gradually reducing group that we now call idiopathic.

As with gonorrhea, great care should be taken that the continued use of local injections does not clear up the original discharge and replace it with one due to chemical irritation alone. A large proportion of the patients presenting nonspecific discharges have an urethral mucosa singularly susceptible to the influences of chemical irritation. Indeed it is far more common to overtreat these cases than is the case with those having gonorrhea. The writer sees many patients each year whose continued discharge is due solely to such overtreatment. Almost the entire cellular content of the discharge is composed of epithelial cells. In other words the mucous membrane is endeavoring to protect itself from the ministrations of the doctor and the patient rather than from the condition that formerly caused it to weep Cure in such patients rests in a discontinuance of treatment rather than more of it. And one should not expect Nature to repair the damage thus done within a day or two It frequently takes a number of weeks for things to regain their normal condition During this time the discharge had best be disregarded. To be satisfied with this course of action or inaction, the patient must be made to understand the reasons for it. Above all things he must be convinced that there are no gonococci present in his canal

Where the discharge continues after the removal of the cause, dilatation of the canal with a full-sized urethral sound upon several occasions may give the desired result. At times the instillation of a few drops of 2 per cent silver nitrate into the posterior urethra may solve the problem. More rarely the topical application of the same strength, to limited unhealthy-appearing areas in the canal may be demanded

The removal of the Trichomonas vaginalis from the prostate probably never is accomplished by massage of the gland Taking his cue from the fact that the parasitologists treat rectal parasitic infestations with hot rectal washes the writer some years ago had his friend Dr William Johnson apply heat by means of diathermy to the prostate. After this some 1 3000 neutral acriflavine was injected into the bladder by means of a rubber bulb syringe and allowed to remain there until the next urination. Some of the solution also was retained in the anterior urethra for ten minutes. This plan of treatment, much to his surprise was almost immediately successful. Upon only one occasion in a number of cases have trichomonads been present after the second treatment and in these they were absent after the third Treatments were given on alternate days and for the sake of safety four or five were insisted upon.

Where urethral discharges are the result of irritative vaginal secretion they usually can be prevented by a precoital douche of sodium bicarbonate solution They always can be prevented by the use of a condom.

Part Two

GONORRHEA IN THE FEMALE

A STUDY IN ANALOGIES

XLIV GENERAL CONSIDERATIONS

THERE can be no question regarding the fact that within the last decade there has occurred a great increase in medical interest in gonorrhea in the female One who adroitly makes inquiries among gynecologists however does not gain the impression that their real, deep interest in the problems involved approaches any nearer the ideal than does that of surgical urologists in gonorrhea in the male. It is true that most of both treat gonorrhea but one finds little to suggest that the one or the other concerns himself any too deeply with either the personal or sociologic aspects of the disease. Largely they shun discussion of it other than upon its surgical aspects, and certainly few of them write upon it. With in the last year the writer mentioned within the hearing of a gynecologist unusually conversant with the attitude of his fellow gynecologists upon the subject, the name of one who both studied the disease and did not fear to write about it. He immediately entered the conversation with the exclamatory remark "My God! let me have that man s name and address! He's a rare bird!"

Despite this decidedly unfortunate state of affairs progress has been made that has reflected itself in an enormous reduction in the number of avoidable complications of gonorrhea in the female. Most of this is due to the fact that many of the older hurtful methods of treatment largely have been discontinued rather than that those who should be leading the way in large numbers are doing so One who was unduly skeptical might suspect that much of this latter has occurred because the treatments discontinued were a nuisance to carry out anyway—procedures of a sort that any one would be glad to discontinue if he suspected

that his patient might do almost or quite as well without them—and that the reduction in the use of such methods does not, of necessity, prove greater interest in or knowledge of the disease itself The writer, though aware that this applies in some cases, is convinced that there is a general increase in both interest and knowledge Certainly, there is considerable economic sacrifice in the newer order of things—a fact that adds much to the glory of the change. Such things do not occur in the midst of economic depressions just because doctors become too lazy to continue them. They are based on a far more attractive foundation wherein lies an interest in the patient and her disease that transcends the desire for worldly gain at a time when it never more sorely was needed.

That the outlook for a further correction of some of our shortcomings in the near future is highly promising can not be doubted. One only has to review the deliberations of the American Neisserian Medical Society to sense this This organization, composed of those who have had at least five years actual experience with some phase of gonorrhea study and devoted solely to the study and the dissemination of knowledge regarding this disease is filling a long felt need Its deliberations upon all aspects of the disease in both sexes have been of the utmost value in both science and professional education. Probably nowhere can be found a more careful sensible and useful summarization of the essential facts regarding gonorrhea in the female and its treatment than exists in the Report of the Committee upon Gonorrhea in the Female (see Chapter LVI) This report, submitted to the general session of the society was freely discussed only slightly amended and voted upon unanimously as being the sense of the meeting Some of the nation's outstanding gynecologists served upon this committee. As one reviews the membership of this society however he is struck by the fact that it contains at least ten urologists to every gynecologist and this is not altogether due to the fact that it was started by a small number of urologists.

There still exists a great need for a better understanding of this disease in both sexes but there can be little doubt regarding the fact that there has been greater progress along these lines in

the male than in the female Thus readily can be understood. For the female offers no such ready criteria of day to day progress as easily are to be obtained in the male. In all respects, she is a far less satisfactory experimental animal when she has a gonococcal infection than is her far more easily studied brother There are so many ways in which gonorrhea can behave in women that they cannot be foretold. In the male such is not the case as it is possible for one really familiar with the clinical behavior of the disease in him to tell from day to day just how it is progressing. In him, there occur no such physiologic storms as help to make it such a formidable disease in the female It is possible to judge with a good degree of accuracy and promptness just what influences the course of the disease for good or bad. Consequently we know more about the disease and its treatment in the male than we do in the female. And as one considers the treatment given both he is prone to wonder why forms of treatment that absolutely would prevent cure in the male can be in any sense curative in the female. Almost, he wonders if many women are not made worse by treatment given them in such good faith.

Obviously the disease in the female offers problems not encountered in the male At the same time there is no great difference in the microscopic pathology of the disease in the two sexes. True there are marked differences in the anatomic and physiologic factors, but many things that we know about the male behavior toward this disease, particularly so far as it is influenced by anatomic structures and physiologic processes should make it easier to understand its course in the female and perhaps point the way to less harmful procedures in treatment than still are resorted to so commonly

Let us start our study of analogy by assuming that, all things being equal, the immunologic responses are the same in the adults of both sexes. It, also is fair to assume that those things that check curative responses in the male will have a like influence in the female. Consequently it is probable as in the male that, in the absence of alcohol sexual excitement and, perhaps excessive activity were there no other preventing influences the female eventually would develop enough curative response to recover from the disease without any treatment whatever Here we are

met by the undeniable fact that during certain stages of life she seldom does such a thing, within a reasonable length of time. Instead of getting well, she commonly becomes the victim of a chronic gonococcal infection and, as hardly ever happens in the male, she may remain so for several years. In searching for the reasons for this, we immediately are confronted by two outstanding factors, poor drainage and menstruation

In considering the question of poor drainage we observe that the female urogenital tract presents a number of minute mucous channels each lined with a susceptible type of epithelium that should offer ideal points for gonococcal colonization Nothing could be better constructed as an ideal place for a prolonged stay of the gonococcus than are Skene s Bartholin s and the endocervical glands In our consideration of such small mucous channels in the male it was obvious that one of three things happened when they became infected by the gonococcus. If they remained permanently occluded, they sterilized themselves sclerosed and ceased to be a factor in the disease If they remained open so that drainage was good they spontaneously recovered from the infection. If on the other hand they only intermittently expelled their contents they retained their gonococcal infection for long periods of time We see perhaps our best illustration of this latter condition in those males who have an infection of some minute para urethral sinus wherein the gonococcus may linger for a year or more.

There is little reason to believe that any number of these smaller mucous channels in the female either remain occluded sufficiently long for self-sterilization or that their drainage often is sufficient to encourage spontaneous cure and every reason to believe that intermittent drainage that most favorable of all for prolonged infection is the prevailing condition. Therefore from this factor alone there is every reason to expect just what so frequently happens chronicity of infection.

There, however is little reason for thinking that this intermittent drainage of small mucous channels is the only factor in the prolongation of gonococcal infection in the female In fact it is apparent that menstruation plays as large a part in the matter, probably a larger one It is evident in the male that anything that stimulates the physiologic processes of a gonorrheal mucous mem-

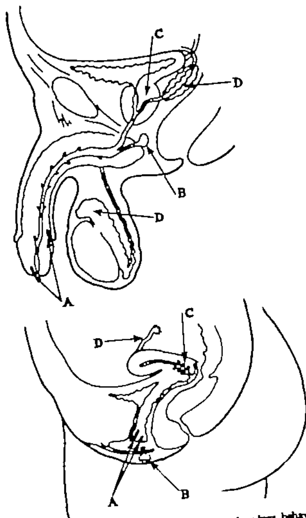


Fig 99.—The structures marked alike in the above drawings behave with striking similarity in both sexes when infected by the gonococcus.

Male

A, Paraírenal and para-urethral sinuses.
B, Cowper's glands
C, Prostate gland
D, Epididymes and seminal vesicles.

Female

A, Skene's and vestibular glands.
B, Bartholin's glands.
C, Cervix uteri.
D Fallopian tubes.

brane puts in abeyance its curative responses And, with such a degree of hyperphysiology as maintains in these infected structures during menstruation, there is every reason to expect a reduction in immunologic effort. It was further shown in the male that repeated influences of the sort obliterated curative responses and favored chronicity The hyperphysiologic state of menstruation lasts far longer than any such events in the male and it is repeated probably before the tissues can entirely recover from the preceding insult. A male who consumed considerable alcohol on four or five consecutive days each month would have his attack of gonorrhea run much the same course

Some light may be shed upon the baneful influence of menstruation upon this disease by a comparison of the varying behaviors of gonorrhea in menstruating and nonmenstruating adult females Before doing this, however it is well to consider certain things regarding the source of curative efforts against gonorrhea. As has been stated in previous chapters it is obvious that human beings recover from such infections because they are able to develop a temporary immunity to the particular gonococci causing a given infection and not because we locally use substances in their treatment that happen to have the power of killing these germs. Furthermore it is overwhelmingly in evidence that immunity in this disease is a local immunity engendered in the infected mucous membrane rather than in the system at large.

We saw in our studies in the male that individuals vary greatly in their ability to muster these local immunity responses that even in adult life some few are extremely tardy in this regard It therefore, is obvious that all susceptible mucous membranes are not alike in their biologic characteristics

As we turn to the consideration of gonorrheal infections in the female prior to the establishment of menstruation we are impressed by the fact that they are not even to be classed with our most poorly equipped males Apparently there is a very feeble ability to develop anything that approaches even a temporary immunity to gonococcal infection in early female life Probably, we are not at this stage of life dealing so much with a chronicity due to poor drainage of the vulvar surfaces or the intermittent drainage of smaller mucous channels Nor are we dealing with those influ

ences of conduct hyperphysiology or treatment that have so much to do with the course of the disease in adult life. Apparently we are dealing with tissues that have practically no resistance.

What of *gonorrhea in the other extreme of life where men*struation no longer is a factor? Apparently it behaves much the same as it does in the male Norris states that "Active gonorrhea in women over fifty years of age is infrequent" and Schumann says "The disease undergoes spontaneous cure."

From the foregoing it would seem that, while the gonococcus lingers in the smaller mucous channels largely because of their poor drainage, it generally continues to do so because the individual menstruates. And it is probable that menstruation introduces a further hazard which does not enter into the picture in the extremes of life unless injudicious treatment causes it to do so For that most dreaded of complications, salpingitis with its further eventualities belongs almost entirely to the menstruating woman.

Much speculation regarding the mode of infection of the fallopian tubes has been indulged in some of it sound and much of it seemingly fanciful. Here again one might learn something of value by a consideration of the course of the disease in the male. *It is overwhelmingly in evidence that gonorrhea spreads* either by surface progression or mechanical transference that it rarely spreads by continuity of surface for any distance into long narrow mucous channels and that it does not spread by continuity of surface for long distances across inhospitable mucous membranes There is nothing in the clinicopathologic course of the disease in the male to suggest that it ever spreads from mucous surface to mucous surface by way of the lymphatic system and there is every reason to believe that such a mode of transference is impossible

The weight of evidence suggests that the uterine mucosa is not in any sense an ideal dwelling place for the gonococcus and as such, it should—and probably does—offer if untraumatized an ideal barrier against the extension of such infections upward And yet a large percentage of all women contracting gonorrhea develop tubal infection which raises the question of how the

gonococcus makes its way from the cervical canal to the fallopian tubes.

One readily can understand how this happens in the traumatized uterus of the parturient woman or the woman who has had an instrumental abortion, but the answer is not so plain in the normal untraumatized uterus. If one safely could reason from what happens in the male in regard to the cause of epididymitis, he would be forced to the conviction that tubal infections usually are due to the extrusion of infected menstrual blood into the tube as the result of uterine contraction He would suspect that most of those that did not occur from this cause had gonococci transported to the fallopian tubes by high-pressure vaginal douches. In other words he would conclude that there was a mechanical transference of gonococci from the cervix to the tube. Surely there is little reason to credit lymphatic transference, for gonorrhea is essentially a mucous membrane disease caused by the penetration of the gonococcus from its surface into its depths and not the reverse

A study of the available data upon gonococcal endometritis develops a definite haziness regarding the condition in the absence of trauma to the uterine cavity from instrumentation, labor or abortion. This haziness is well evinced in the statement of W P Graves to the effect that 'The gonococcus in passing the barrier of the internal os proceeds to the tubes doing little serious damage to the intervening endometrium which it uses more as a bridge than as a soil for permanent propagation. The tubal isthmus, though small in caliber is an open portal for all fluids and organisms that pass the internal os so that the gonococcus finds ready *access to the tubal mucosa etc* *Curtis believes that the* endometrium offers a poor abiding place for the gonococcus and that its virulence is soon lost in the uterine cavity Eden and Lockyer *state that, 'We do not as a rule meet with acute uterine* gonorrhea in gynecological practice

Almost it would seem that much of our belief in the frequency of true gonorrheal endometritis was developed as a means of explaining how the gonococcus traveled from the cervix to the fallopian tubes, for apparently it has little pathologic proof One senses this rather clearly in the following quotation from Graves

"Gonorrheal endometritis is so rarely encountered that it was formerly supposed that the uterine mucosa enjoyed mysterious immunity to the infection a special provision of nature, as it were, for preserving a nesting place for the fecundated egg. Inasmuch as it is inconceivable that the gonococcus can reach the tubes from the cervix in any other way than by infecting the intervening endometrium, it is quite evident that in all cases of gonorrheal salpingitis there must be a preliminary stage of endometritis, and that such endometritis must have the peculiar property of an early spontaneous cure. This is shown in the microscopic examination of uteri removed for acute gonorrheal adnexitis, in which signs of active endometrial inflammation are rarely revealed."

One hardly could ask for better proof that much of our supposed knowledge of the subject is based more on theory than on fact. Not only is it not "inconceivable that the gonococcus could not reach the tubes from the cervix in any other way than by infecting the intervening endometrium" but there are many reasons to think that that is just what it does. In the male we see it overcoming far greater obstacles than these in the transit from the posterior urethra to the epididymis. (See chapter on "Epididymitis.")

The fact that salpingitis rarely if ever occurs in the non-menstruating female in the absence of direct trauma to the uterine cavity or high-pressure vaginal douches together with the doubtful status of acute gonorrheal endometritis in the absence of trauma, urges the importance of a closer study of the possible mechanical factors involved in those patients who have not had these direct causal influences and yet, develop salpingitis. For if this complication is most commonly due to mechanical influences rather than to infection by continuity of surface, the reduction of its incidence of necessity must rest in a control of those mechanical factors.

Nothing is really gained by assuming that because a bacterium reaches from one point to another the intervening mucosa must of necessity share in the infection, though most of the evidence is against such an assumption. Let us see then what evidence we have to support the idea of the mechanical transference of the

gonococcus from the cervix to the tubes where direct trauma is not a factor

1 Salpingitis rarely precedes menstruation, it follows it.

2 Salpingitis is most likely to follow a menstruation accompanied by much uterine contraction

3 It is common in nulliparae in whom the cervical canal is most often narrow

4 It is almost the rule in women with marked retroflexion of the uterus

5 In acute endocervicitis the mucosa often is so swollen as almost to occlude the cervical canal and thus encourage uterine contraction.

6 "The tubal isthmus though small in caliber, is an open portal for all fluids and organisms that pass the internal os so that the gonococcus finds ready access to the tubal mucosa etc." (Graves)

7 Microscopic evidence of acute gonorrheal endometritis in uteri removed for acute adnexal disease is largely wanting

8 Blood commonly retrofluxes through the fallopian tubes at menstruation. (Sampson, Curtis.)

9 Endometrial tissue at times escapes into the abdomen via the fallopian tubes and causes the various types of endometrioma found in the abdominal cavity (Bailey Sampson, Curtis)

10 Salpingitis is more common in women with patulous cervical canals who use high-pressure douches

11 Experiences with transuterine insufflation of the fallopian tubes (Rubin test) or the injection of radiopaque substances have shown the ease with which substances pass from the uterine cavity into the tubes and beyond.

12 Salpingitis hardly ever occurs in the absence of direct trauma in the nonmenstruating female

13 There is nothing in the clinical course of gonorrhea in either the male or female to suggest lymph stream transference of infection from mucosa to mucosa.

14 The mechanical factors for the production of back pressure are far more simple in the female than are those in the male which produce most cases of epididymitis

With so many reasons to believe that salpingitis is a condition

resulting from mechanical causes and so few to suggest that it is due to infection by continuity of surface it is highly suggestive that, as is the case with epididymitis prevention of it rests largely in finding some way to remove these mechanical factors In other words, we either must have a freely draining uterine cavity that does not encourage strong uterine contraction, a miniature labor with its inevitable increase in intra uterine pressure or we must find a way safely to check menstruation. The former is simpler than the latter One sees a suggestion of the realization of the value of obliterating uterine and cervical contractions in the writings of Schindler[1] by his insistence upon the use of atropine during the acute stage of gonococcal infections of the cervix. It is probable that the female with the normally placed uterus and large cervical canal seldom, if ever gets salpingitis in the absence of trauma or high-pressure vaginal douches.

Familiarity with the immunologic aspects of gonorrhea is sure to arouse a distinct question in one's mind regarding the possibility of the recrudescences of cervical infections being due to the factors to which they usually are ascribed. One constantly meets two statements in this regard which would seem to have little scientific foundation statements which savor of an effort to explain a clinical occurrence in much the same way as we have seen the occurrence of salpingitis explained by the assumption much against the evidence at hand of endometrial extension. These two statements are (1) that these recrudescences at times are due to the emptying into the uterus of an infected fallopian tube but (2) that most often they are due to repeated reinfection of the cervix through sexual intercourse.

Considering first the possibility of the emptying into the uterus of the contents of an infected tube, we find little in the pathologic picture of the tubo-uterine isthmus to suggest that this occurs with great frequency And there is abundant reason to believe that, if it did occur it would occasion no such clinical response as it has been used to explain It has been shown by almost every one who has investigated the problem that the gonococcus rather quickly disappears from the tubal contents Such being the case

[1] Arch. f Gynäk Berlin, 1909 XXXVII, p 609

there is little reason to think that this fluid repeatedly could occasion a superinfection of the cervix if it did escape.

We, however, have seen in our studies of the male that the emptying of fluids rich in the products of gonococcal disintegration upon a mucous membrane did occasion what we have called a "toxin response (See chapter on the "Causes of Symptoms.') We also have observed that such a "toxin response" almost always subsides within forty-eight hours, an observation entirely out of accord with these cervical recrudescences which last for far longer periods of time. It, therefore, is probable that such an explanation fails utterly to explain any great number of these irregularities in the course of gonorrhea of the cervix.

What of our *other* explanation? There probably is even less reason to credit this than the above Perhaps in those women who constantly expose themselves to a number of men this reason might hold, but we find nowhere in the literature any suggestion that they are the only ones to whom this explanation is applied. We have seen in our studies of immunity in the male, and there is no reason to suspect that the female differs that an individual rarely can be superinfected by the particular "strain" of gonococci responsible for his disease (See "Defensive Processes Against Gonorrhea," Part One) He repeatedly can be superinfected by his own strain of gonococci if they are transferred to the genital tract of another and reacquired by him. There is nothing in our knowledge to suggest that this latter could occur repeatedly if he cohabited only with one female. The history of marital gonorrhea suggests no such possibilities for it is common observation that both parties develop a refractoriness to superinfection by the family strain and that if recurrences do take place they do so because one party has recovered from his disease as the result of an immunity which is active against his partner's "strain"

It therefore is reasonable to assume that these irregularities in the course of cervical gonorrhea are rarely due to either of these supposed causes. One does not have to summon up reasons so lacking in scientific foundation to explain these occasions. *In fact*, to accept these as answers serves to blind one to more obvi

ous factors in such occurrences and to turn his mind from preventable events which are so potent in the causation of other things of moment in this disease. We do not, in the male, think of recrudescences of symptoms as either superinfections or reinfections but, if we are wise, we more closely study those other events that have so much to do with making the course of gonorrhea depart from its usual cycle. Almost always, we find that the individual has departed from his prescribed course of conduct, that he has indulged in either alcohol sexual excitement, or both. And it probably is a fact that things do not differ greatly in this regard in the female, whose disease also is influenced to a greater degree by physical activity than is that of the male, and in whom menstruation plays such an important part. We, therefore would do well to pay more attention to what the female does than to dismiss the matter on the strength of less obvious explanations.

We do not do well to view gonorrhea in the male and female as two entirely different problems, for much is to be learned from a comparison of their clinical behaviors. The same bacterium with the same biologic characteristics the same likes and dislikes, is responsible for both, and what adversely influences the disease in one will have a like influence in the other We well may develop the habit of looking to the male, the more easily studied sex, for a key to the solution of the perplexities of gonorrhea in the female, for we can find there many things that will help us greatly

XLV ANATOMY AND HISTOLOGY

It can be seen from the foregoing discussion that one who treats gonorrhea in the female requires even a more intimate knowledge of the urogenital structures than does he who treats only gonorrhea in the male. Not only must he be thoroughly familiar with their gross structures, but he must know the histologic character of their lining mucous membranes. For without such a knowledge he is poorly equipped to follow the course of the disease and more poorly fitted to treat it.

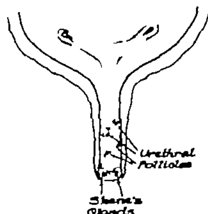


Fig 100.—Outline of the female urethra to show locations of the openings of Skene's glands and the urethral follicles.

As in the male one carries from his dissecting room days a sufficient groundwork for such an understanding, for which reason there is little need in the present treatise to give much space to matters of gross anatomy It is of greater value to confine ourselves to the more minute details which have such an important bearing upon this infection after its most acute stage. The disease centers in the smaller columnar-lined channels from which it overflows upon contiguous less hospitable areas and recedes as the activity of the process varies. It does not, in the

adult, linger as an active inflammation where drainage is good unless it is made to do so by faulty conduct or faulty treatment. It is the same gonococcus with the same partialities (See chapter on "The Influences of Histologic Structure, Part One.)

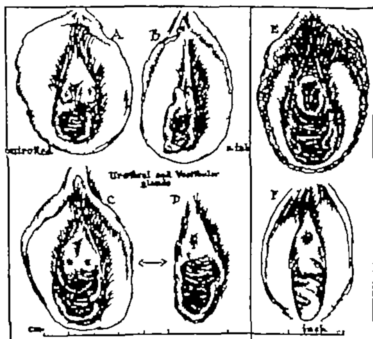


Fig. 101.—The meatus and vestibule. A, Outrolled swollen and infected urethral glands from which pus may be squeezed. B Glands opening on the urethral tabs or "labia" each side of meatus with infection and swelling nearly gone. C, Urethral glands too shallow or simple for persistence of inflammation, but around three of the four glands of the vestibule persistent long infection has caused swelling and protrusion. D, After cure, this vestibule shrinks to normal. E, Red streaks and blotches on two hymen tabs, on the base of the labium and on five places about the swollen meatus. One high vestibular gland has a streak below it. F Red meatus of mild nonspecific senile urethritis (Courtesy of Dr R. L. Dickinson.)

Viewing then, the adult female urogenital tract from the standpoint of the ideal points of colonization that it offers to the gonococcus, we find that it can be considered in three zones, the vulvar cervical and tubal.

In the vulvar zone we find the introitus covered by stratified

squamous cells and, just inside of the urethral meatus are Skene's glands which, with those in the uterine cervix, are the most commonly infected and which, together with Bartholin's glands, retain their infection longest. These simple, occasionally compound tubular glands usually have their openings on the posterior urethral wall, one on each side of the midline, and extend parallel with the urethral canal for a distance of from ¼ to ½ inch Upon rare occasions there may be a third canal in the midline and there may be one or more such canals opening be-

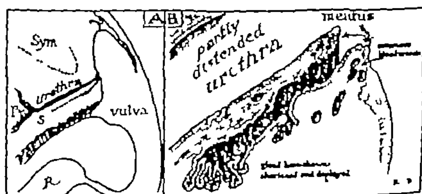


Fig. 102—Section of urethral gland. A, Its angle with patient on back. B, Great enlargement to show its narrow mouth, the expansion just beyond, and the multiple pockets at the far end. The diameter of the urethra is 6 to 8 mm., distensible to 10 or more the diameter of a gland is 1 mm. at the mouth 2 mm. deeper the depth from 0.5 to 2.5 cm., according to Schüller who says 2 cm. is common See S on diagram A. (Courtesy of Dr R L. Dickinson)

neath the outer margin of the urethral meatus, the vestibular glands. All of these structures are lined by columnar epithelium.

There are particularly in the lower third of the urethra some follicles of much the same structure as the glands of Littré in the male urethra which at times become infected They rarely however retain their infection as the disease emerges upon its *latent period* though it is well to remember such a possibility The urethra is lined throughout most of its extent by stratified squamous epithelial cells though areas of pseudostratified columnar cells are common (Maximow) In this arrangement we find

ample explanation for the rarity of true chronic gonococcal urethritis.

The vesical outlet, trigone, bladder and upper urinary tract are lined by stratified transitional epithelial cells as in the male and they present identical degrees of susceptibility in both sexes.

Bartholin s or the vulvovaginal glands are of the compound racemose type and are situated deep in the labia majora, empty

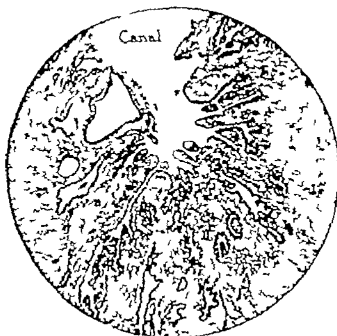


Fig 103.—Section of chronic gonorrheal cervicitis. This illustrates very well the complexity of this structure and demonstrates the futility of expecting greatly to influence the glandular depths by applications made to the cervical canal itself. (Courtesy of Dr A H Curtis)

ing through minute canals on the inner surfaces of the labia minora at the junction of their middle and posterior thirds. They and their canals likewise are lined by columnar epithelial cells. Of all glandular structures they are most ideally constructed for prolonged gonococcal infection

The mucous membranes of the vulvar structures of the adult are of the stratified squamous-cell type and while they often

partake of the inflammatory process of the acute stages of the disease, they do not offer an ideal place for gonococcal penetration for which reason they are not in the adult of great importance from a disease standpoint after the first week or so. They never harbor a chronic gonococcal infection, though they may at times be kept decidedly irritated as the result of being constantly bathed by purulent products.



Fig. 104—Section of normal endocervix. Considering the predilections of the gonococcus a more ideal abiding place for it hardly could be imagined. Here we find surface and glandular epithelium of the most ideal type and architecture of the most favorable sort for longevity of infection. Nothing could be better devised to promote intermittent emptying of the long, narrow tubular glands (Courtesy of Dr W P Graves)

The adult vagina is likewise lined by squamous epithelial cells. The gonococcus practically does not penetrate into such surfaces and as there are no glandular offshoots in this expanse, it is not an area of great importance from a disease standpoint Like the vulvar mucosa it at times is influenced by the presence of purulent products from other structures, but it spontaneously recovers when these no longer are poured out.

The cervix uteri is unquestionably the most important of all urogenital structures in this disease. It not only is the point from which the fallopian tubes receive their gonococci, but it is the most common site of long-standing gonococcal infections Almost, Nature seems to have planned it so that the gonococcus shall not disappear from the face of the earth. She made its body of dense resistant tissue poor in musculature she lined it with columnar mucous membranes, she penetrated its structures with deep tubular glands similarly lined she protected their openings by cross bands the arbor vitae and then she completed the work by making the glandular secretion so tenacious as to plug the cervical canal and thus prevent even fair drainage. Above all this she placed a narrowing, the internal os, and an inhospitable type of membrane the endometrium, as though she would protect woman from those most deadly of all gonococcal complications, salpingitis and peritonitis, so that she might live long to furnish the gonococcus a permanent home.

The endometrium varies so greatly in the menstruating woman as almost to defy description. In the present connection it receives its greatest importance from the fact that it does not furnish an ideal place for gonococcal growth. The traumatized uterus, like the traumatized bladder furnishes an exception to this seeming rule but the weight of evidence would suggest that true gonorrheal endometritis is either a rare or a very fleeting condition in the absence of direct uterine trauma. Clinicians and pathologists have indulged in much argument pro and con upon this subject for many years and still they are not in accord Schumann sums up the matter in the following words "It is usually essential that the endometrium should have either suffered from trauma or be at a low stage of resistance if acute gonococcal endometritis is to develop."

The fallopian tubes are narrowest at their uterine ends where Nature apparently tried to arrange things so that the uterine contents would not reflux into the tubes. And, as a means of making those substances that did pass her barrier return to the uterus, she lined the tube with ciliated columnar epithelium and she made the cilia wave toward the uterine cavity As is so com-

monly the case in the human architecture, the arrangement has proved only moderately successful much to the annoyance of those who treat gonorrhea in the female. It probably works where the offending body is of microscopic size and lacks motility

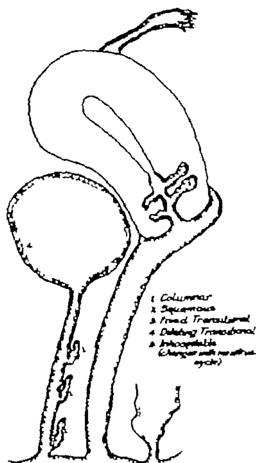


Fig. 103.—Diagram to illustrate the locations of the various types of mucous membrane in the female urogenital tract.

but it could not quickly return a spurt of menstrual blood or douche fluid laden with gonococci And if it tried to do so surely a few germs would become entangled in the intricate out foldings of mucous membrane almost filling its lumen Thus we see what might be called architecture in reverse in the presence

of gonococcal infection for the extremity that then would be safest for the patient if it were larger the tubo-uterine isthmus, not only is the smaller but it readily becomes occluded. The current of gonococcus-laden pus thereby is directed toward the larger opening the fimbriated extremity, and, unless this also has become occluded by the inflammatory reaction, the tube debouches its contents into the peritoneal cavity where they further mutilate.

XLVI MODES OF INFECTION

Many careful studies have been made regarding the modes of infection in infants and larger children but there still is much to do before the entire question is solved That there is great need for a better understanding of the subject is outstanding. *Not only does gonorrhea and its treatment exercise a profound* psychic impression upon all children who have reached an age of some understanding, but it interferes with the schooling of thousands. Often, it places them in a group aside from their playmates, a condition favoring the formation of mental fixa *tions that are prone to influence their human contacts throughout* life.

The rather common custom of attributing most such infec tions in older children to an infected toilet seat is based upon a decidedly poor foundation in fact. While one must concede that such a mode of infection is possible, and, perhaps, does occur at times, close investigation usually will reveal other factors more in accord with the biologic characteristics of disease transference. Nelson who has investigated personally a number of cases in both schools and homes thinks lightly of such a cause of infection. He and Crain[1] express themselves with considerable force in the following quotation A great deal has been said but little evidence has been presented against the public school toilet seat as a factor in the spread of gonorrhea among girls. There is this evidence of its innocence that although the whole school may use the toilets during a brief recess no *epidemic* of gonococcal vulvovaginitis in a public school has ever been recorded Cases of disease have most certainly been found in many school girls but although the toilets have been promptly blamed as the easy way out the probability of infection at home or through sexual contacts has not been carefully ruled out. Actually when thorough investigations are made it is by all odds the rule to find

[1] N A Nelson and Gladys L Crain Syphilis, Gonorrhea and the Public Health, 1938 By permission of The Macmillan Company New York, publishers

more likely sources of infection outside of the school. It is less embarrassing to accuse a toilet seat than to seek for sexual sources or to request the examination of other members of the family And it requires much less tact and no labor"

So far as the infection of infants is concerned, other than those infections acquired at birth Nelson, in the above mentioned volume, states that he has "investigated three outbreaks in Massachusetts hospitals which were undoubtedly caused by rectal thermometers. One of these was in a nursery where several male and female infants developed gonococcal arthritis the others were in children s wards in general hospitals. In all three, the only common factor was the thermometer ' This certainly is the most plausible explanation for hospital acquired infections and urges the great need for either a different thermometer for each child or a far better type of sterilization of them between their use than seems to be the case.

It is inconceivable that a nurse or attendant having gonorrhea would convey moist pus from her own vulva to that of the child no matter how careless she might be. And it is equally unlikely that such infections could be gotten from bed linen in any great number of cases. Careful inquiry in home infections should turn investigation toward enema nozzles that may also be used by older females as douche nozzles to sexual tampering and, perhaps, to the much maligned toilet seat.

In the adult female, infections are almost entirely the result of direct sex contact with one having the disease. It, of course, is conceivable that the use of douche nozzles employed by one having the disease could convey the disease to another The speed with which the gonococcus dies upon drying would require that the nozzle be used while still moist. The further fact that most of the solutions used for vaginal douching are decidedly lethal to any gonococci with which they come into direct contact would tend to reduce greatly the possibility of infection from this source.

While, theoretically there is far greater possibility for accidental gonococcal infection in the adult female than in the male it is probable that it does not occur more often in one than in

the other There usually are far greater social reasons why the female should be more reticent regarding her sexual pursuits and it is but natural that a sex, taught from the beginning of menstruation to mislead about this normal occurrence should be far more proficient in the art of dissimulation than is a sex in which the same urge to deceive does not maintain from childhood Wherefore it should be realized that the physician is but a child in the hands of a woman intent upon deception and he should be willing to bow to the art with admiration for its finer points At the same time he need not let it greatly disturb his scientific reasonings which almost always are correct if he disbelieves such immaculate infections. It does no harm to a bathtub toilet seat, or douche nozzle to be accused of having infected a woman and it assuredly is a great comfort to the woman.

XLVII. INCUBATION PERIOD

If we adhere to the usual definition of incubation period as that time that elapses between the acquisition of the causal bacterium and the onset of objective or subjective symptoms, it is obvious that modern therapeutic advancement has ushered in a condition wherein many women do not have such a period For, as has been mentioned in several places herein many of those women infected by men seemingly cured by sulfanilamide do not develop any symptoms whatever being asymptomatic gonococcus carriers from the moment of infection. Even before the use of this drug some few infected women failed to have sufficiently pronounced symptoms to call attention to the infection Most of these, however did present some of the local signs of infection and did have a slight purulent discharge. Such is not the case with those mentioned above. They have neither stigmata nor discharge and it is only by the most careful studies that they are shown to harbor the gonococcus. Aside from these two groups of cases there is no reason to believe that there is any difference in time between the incubation period of male and female.

Though the determination of the period is of great scientific interest, it is not always too safe a thing upon which to base opinions of guilt. It is safe to say that the disease does not show symptoms until after a lapse of sixty hours and that contacts during that time need not have been infective ones. More often the contacts themselves acquire the infection. It, also is well to bear in mind that the first one of a pair to develop symptoms is not always the one who was infected first. When one s own gonococci are grown on another's mucous membrane and reacquired they usually set up an active infection upon the already quiescent one Several such cases have come to the writer's attention one of which is worth citing The patient and his wife had transferred infections back and forth over a period of years. At any time gonococci could be found in the husband s urethral

secretion and from time to time, he had a scanty urethral discharge which had been present so many times he had come to disregard it After some months of illness the wife died. Six months later the husband *remarried without having submitted* himself to any treatment in the meantime. Four days after marriage his second wife had an acute attack of gonorrhea and three days later the husband likewise developed a profuse gonorrheal discharge. He was sure that his new wife must have infected him as he had not had sexual intercourse since his first wife's death Had the writer not been conversant with conditions he, too, would have been likely to suspect the lady of having had a farewell party the night before her marriage. When things were explained to him and he was reminded that he had been urged repeatedly to have treatment, he became very repentant, indeed.

In these days when so many women are made symptomless gonococcus carriers from the start as the result of the peculiar action of sulfanilamide upon some individuals, it is particularly hazardous to voice too many conclusions regarding infection source. *Gonococci so thoroughly hidden as are those in such* carriers may not infect another during weeks or months of sexual contacts. The writer has records of 5 patients who infected their wives shortly after three or four-day "cures" by sulfanilamide. Three of the males had later recurrences were cured by other methods and despite later unprotected coitus, did not again become reinfected by their wives for from one to six months. In neither of the six cases did the wife have either stigmata or symptoms of gonococcal infection. In 1 gonococci were found at the first study in 2 at the third in 2 at the fourth study Another woman who was suspected of infection solely because she had been exposed had many careful studies before gonococci were demonstrated in the secretion from Skene's glands In all of the cases the husbands had been cured" of gonorrhea by sulfanilamide. In none of these women was there the slightest thing to suggest older infection. With such things so prominently in the clinical picture of this disease the physician should tread very carefully when he wanders into the fields of legal medicine. He should be particularly wary about his opinions upon who infected whom

XLVIII. SYMPTOMS OF GONORRHEA IN THE ADULT FEMALE

COMPARATIVELY few diseases differ more widely in the early symptoms they produce in different individuals than does gonorrhea in the female. Starting at symptomatic zero it passes through all of the gradations up to the most pronounced pain and discomfort associated with fever profuse purulent discharge and almost unbearable vesical discomfort. If however one were to group these variations in the severity of the early symptoms by percentages ranging between that group with no early symptoms and the group presenting what might be called the maximum or 100 per cent, he probably would find about 75 per cent of them would fall between what might be considered the 10 to 30 per cent severities 5 per cent would fall below the former figure, 10 per cent between about 30 and 60 and perhaps 5 per cent would fall in the higher brackets. Further analysis probably would reveal that many of those falling below the 10 per cent level, particularly those with no symptoms, were infected by seemingly cured sulfanilamide treated males And as in the male, most of those in the brackets above 50 per cent severity would be women who had had much alcohol and sexual inter course during the period of incubation.

With such variations in the symptoms during the early days of infection it is obvious there is as great a need for Stokes "higher level of suspicion here as there is in syphilis. Par ticularly is this true because of the fact that many women have almost identical symptoms from so many things other than gonorrhea, and that few of the unmarried are frank enough to admit sexual contacts. It has become equally so of those who are mar ried, for it is the experience of all urologists that there is a steadily increasing incidence of gonorrhea in married men and sexual transgressions among married women are by no means as rare as they were only a few short years ago.

As most infections occur in the urethra, and those of the cervix are singularly lacking in objective symptoms, the most common early symptoms are those of the urinary tract. Frequency of urination with urethral burning during the act are the things that most commonly direct attention to the parts. Vulvar symptoms may be absent, but usually there is noticeable purulent discharge and a feeling of heat and discomfort. This discharge may be mucoid in character and if unaccompanied by sensory symptoms, it frequently is explained in the patient's mind as a leukorrhea due to too much physical exertion. This is particularly so if it occurs near a menstrual period.

Inspection of the parts at this time usually will show some pouting and edema of the urethral meatus, redness of the mucosa of the introitus, and pus in which the gonococcus usually can be found. The gonococcus usually can be demonstrated as well, in the washed sediment of the first small portion of the voided urine. Should infection of a Bartholin s gland be present, the corresponding labium is swollen and there commonly is a punctate area of redness surrounding the duct orifice

If there is no cervical infection the local symptoms gradually decrease, the urethral pouting disappears, the mucosa of the introitus assumes almost its normal color and the discharge grows less and less. The urinary discomforts rarely last more than a week or two and usually within a month or two, in patients who avoid alcohol, sexual excitement and too much physical activity there is little to suggest infection. There commonly are slight recrudescences of symptoms during and for a few days after menstruation which frequently are attributed to that cause and not to the infection

In the presence of cervical infection there may be a sense of fullness in the pelvis and the vaginal discharge continues for a much longer period of time The cervix is swollen and reddened and pus may be seen coming from the os uteri. At times there is definite erosion of the mucosa around the os. During the early days of cervical infection, demonstration of the gonococcus in its pus usually is a simple matter but as times goes on this becomes more and more difficult.

Gradually the infection, if it does not pass into the tubal zone, settles into a degree of latency wherein visual evidences of its presence largely are lacking Gonococci still persist in such smaller mucous structures as Skene's Bartholin s and the endocervical glands, but the amount of gonococcal products poured from them upon the free mucosa, except, perhaps, at menstruation, is insufficient to cause great irritation. This erasure of visible evidences is far slower in the cervical than in the lower zone infections, particularly if there has been much erosion of the membrane around the os uteri. Thus is ushered in what so commonly has been called the chronic stage.

Should infection pass to the fallopian tubes there is usually a chill or chilliness followed by a temperature elevation of from 101 to 103° F., rarely higher Nausea and vomiting are common. There is pain in the lower abdomen with much tenderness and varying degrees of muscular rigidity Malaise, headache and rectal tenesmus are common. In some cases the abdominal symptoms and tympanites are so marked as to suggest a generalized peritonitis. There also is a marked leukocytosis in practically all cases during this acute stage.

The acute attack usually quiets down in anywhere from a few days to three or four weeks but there still persist pelvic symptoms which commonly can be stirred into marked activity by seemingly insignificant things in the patient s conduct or treatment. Particularly is this so at or near the menstrual period. Carefully treated and with good patient control, the condition rarely reaches a stage where surgical intervention is imperative. Such patients commonly are completely or partly invalided for some months Modern treatment, however in some cases does much to lessen this period that formerly seemed to be so long drawn-out in many women.

XLIX. DIAGNOSIS

Though the diagnosis of gonorrhea is rather an easy matter during its acute stages, no such simplicity holds when its surface stigmata have disappeared and the infection has colonized in the smaller mucous channels of the cervix and the vulvar zone. In the first week or two of the disease in most patients the presence of discharge, the redness of the mucous membranes of the introitus the pouting of the urethral meatus and changes in the uterine cervix, when involved together with the ease in demonstrating typical gram negative intracellular diplococci leaves little room for error

In those women who become asymptomatic carriers from the start and in the others who have passed into a stage of local latency the possibilities for error are great. As a rule there are few if any gonococci in the surface secretions and the large assortment of other bacteria both gram-negative and gram-positive, that commonly are present offer many misleading microscopic pictures. Not only are there frequently many gram-negative diplococci present that are much smaller than gonococci, but gram negative elements of normally gram-positive cocci that do not differ in size from the gonococcus are by no means rare It is because of these things that most careful microscopists insist upon the finding of typical gram-negative intracellular diplococci before accepting extracellular elements as gonococci. This is, indeed, a wise precaution for as has been pointed out elsewhere the Gram stain may be highly misleading in its results unless great care is taken with the stains and the manner in which they are applied

There are further hazards in this regard that are not appreciated to the extent that they should be To him who sends his microscopic work to a laboratory they are likely to cause much embarrassment. Unless one has studied hundreds of slides from both the male and female he seldom has enough familiarity with such studies to make his opinion of great value And many

workers in laboratories, as well as many physicians, who do some microscopic work along this line make a large number of mistakes that would not occur in the hands of better trained workers.

For a number of years it has fallen to the lot of the writer to give courtesy opinions to many of both groups as to whether or not a suspected bacterium was really a gonococcus. Upon far more occasions than the reverse, the bacterium which they were practically sure was a gonococcus looked little more like that bacterium than a chestnut looks like the moon. Often, with real intracellular gonococci on the slide, they would pick on others as being gonococci. Many of the smears have been so thick that no one could or should venture a diagnosis upon them A well-done Gram stain has been so rare that one felt like pinning a medal on the one who did it.

Upon too many occasions to count, the minute gram-negative cocci and diplococci so common to these parts had been used as a basis for a diagnosis of gonorrhea. Such errors seem to be far more common in small commercial laboratories than in those connected with hospitals That errors may occur even in state laboratories is shown by the following authentic occurrence A physician in a near-by state sent a smear from a woman patient to his state laboratory The report came back as positive for gonococci. Before the news was given to the woman her husband appeared in great alarm stating that he once had had gonorrhea. He begged the doctor not to show his wife the report, to go on and treat her for what he thought she had but in some way get a report that said "no gonorrhea" from the laboratory The physician who agreed to do this, made a smear from his own mouth and sent it to the same laboratory The report came back as "positive." One who has studied many smears from the oral cavity knows that gram-negative and gram-positive cocci and diplococci are common but very few indeed have seen typical gram-negative intracellular diplococci in oral smears. Yet that laboratory prides itself upon the accuracy of its interpretations on smears sent in for suspected gonorrhea.

Unfortunate as these things really are the entire blame can not be placed upon the laboratories for this highly unsatisfac tory state regarding a method of diagnosis upon which such im-

portant things so often depend Laboratories must study what is presented to them and it is an undeniable fact that a large percentage of the smears made from the female that are sent to them would defy diagnosis of any kind except that the one who made them did not know how to make a smear that could be studied microscopically It is equally a fact that many of the smears are taken from areas upon which gonococci rarely are found despite their presence in adjacent structures.

Thus, there is need for improvement upon both sides of the question. Of a certainty many laboratory workers need much careful training along these lines. And, just as surely, many physicians should acquaint themselves with the type smear that permits of reliable microscopic study Many more should learn to collect smears from such locations as are likely to harbor the gonococcus, and in such a way as to bring the germ to the surface if it is in these structures.

The great fault with a large number of smears from the female is that they are too thick. This limits study to the edges of the thicker areas if there are any thin edges. In other words, literally thousands of leukocytes if pus is present, are piled one upon the other in such a way as to make it necessary to disregard them and to limit the microscopic study to just those that happen to be in the thinner portions. Unless gonococci are found in these limited areas the report should read "slide too thick for proper study" Certainly no responsible laboratory should risk its reputation upon a study as incomplete as these generally are. And they would do much toward correcting conditions by sending out a few reports of the kind

One of the chief reasons for thick spreads from the female genitalia is that efforts are made to smear some of the plug of cervical mucus on a glass slide Not only can this not be spread evenly but it is mostly a waste of time to study it microscopically after the acute stage of the disease. It usually is so highly alkaline that the gonococcus rapidly is destroyed in it just as it is in culture mediums with a pH above 8 The endocervical glands can contain countless of these bacteria without a single one being demonstrable in the plug of cervical mucus Smears commonly are submitted for study that are taken from the vault of the

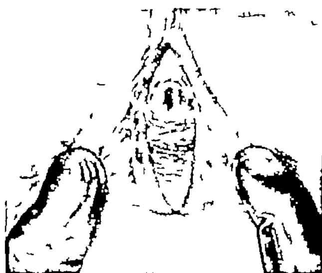


Fig. 106.—Urethritis and bartholinitis. On retracting the labia, the external urinary meatus appears as reddened elevated area. The mucosa is thickened and more or less everted. This is especially noticed in the labia of the urethra. The exit to Bartholin gland on the right side is reddened, and presents the typical appearance f gonococcal macula. A small drop of pus is seen to exude. As result of the irritating discharge the vulvar orifice seems to be more or less inflamed. The infection f the crypts about the urethra is well illustrated. (Courtesy of Dr. C. C. Norris.)



vagina and from the vaginal introitus, in neither of which is the gonococcus found after the subsidence of acute discharge. It, thus, can be seen that, if one is going to make use of either spreads or cultures in the diagnosis of this disease, and, particularly as tests of cure he must have accurate knowledge as to where the gonococci most likely are to be found and how they can be gotten from their places of hiding

The most frequent sites of gonococcal colonization are in Skene's, Bartholin s and the endocervical glands. Upon extremely rare occasions they may be in some of the urethral follicles or in some submeatal (vestibular) glands, if these are present. The technic for obtaining the secretions of these deeper mucous structures is an extremely simple one and if properly carried out, will reduce markedly the margin of error in both microscopic and cultural studies

If there is pus exuding from the urethra a smear of it should be obtained on a small cotton-wrapped applicator or by a platinum loop and thinly spread on a glass slide. If no pus is seen, the meatus should be wiped dry with a piece of cotton to avoid the inclusion of a lot of possibly confusing vulvar bacteria The finger then should be passed within the vagina and the urethra firmly stripped from above downward against the pubic arch. While the finger is in this position it is well to pass its tip from side to side to see if cordlike indurations can be felt in the region of Skene s glands Curtis places great value upon these, if felt, as positive evidences of gonococcal infection. After the urethra is stripped a small applicator is rubbed into the distal end of its floor and any material obtained should be placed on a glass slide One should not conclude that there is no infection if there is no visible pus stripped from the glands to the meatus. These are minute structures and the amount of secretion pressed out may be insufficient to appear at the urinary meatus. Pus and gonococci commonly are found at microscopic study upon patients showing no macroscopic pus.

To obtain the secretion of Bartholin s glands the ostium of the duct should be cleansed with cotton the gland region rather firmly kneaded between the thumb and the intravaginal index finger A platinum loop then should be rubbed over the gland

outlet and anything obtained should be spread upon a glass slide for study Materials for culture should be obtained in the same way Glands that can be palpated clearly almost always are pathologic and, though they can not be taken as surely gonorrheal they are highly suggestive of that infection.

In order to obtain satisfactory specimens for microscopic study of the secretions of the cervical glands, the plug of cervical mucus should be removed entirely (Fig 107) After this has been accomplished the entire cervix should be subjected to firm

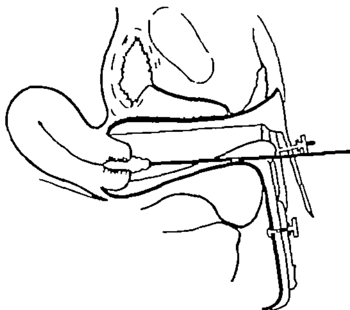


Fig 107—Removing the plug of mucus from the cervical canal as a first step in obtaining spreads therefrom for diagnostic purposes.

pressure in order to force secretions from the glands into the canal (Fig 108) A cotton wrapped applicator then should be rubbed with slight pressure over the mucosa of the entire cervical surface (Fig 109) and smears made therefrom. In this way one not only avoids the inclusion of thick cervical mucus that will not spread evenly and rarely would show the gonococcus if it did but he secures thin material that makes ideal spreads for microscopic study

If great care is taken in obtaining the proper materials in

thinly spreading and correctly staining them, there will be far less disparity between the results of the smear and cultural methods for the demonstration of gonococcal infection. For it probably largely is because of faults in technic and the superficial study of material obtained that the cultural method is so much more reliable in large groups of cases.

Neither in diagnosis nor in tests of cure should one content himself with a single negative study, whether it be microscopic or cultural. In many latent cases of gonorrhea in the female the

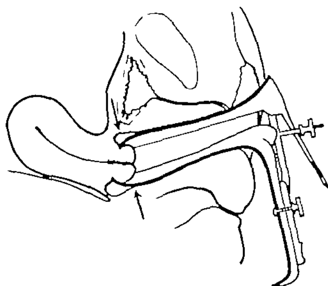


Fig. 108.—Compressing the cervix to force the secretion from the endocervical glands as a second step in obtaining spreads.

gonococcus is exceedingly difficult to demonstrate by either method. There should be repeated studies in every case where the disease is suspected or known to have existed. Because of the adverse influence of menstruation upon this disease one is more likely to find the gonococcus in spreads or cultures taken within the first two days following menstruation than is the case during the intermenstrual period. In Germany great stress is laid upon the wisdom of carrying out such studies in the middle of the menstrual period From the reports it is evident that

the number of positive findings at that time is decidedly increased. Though not generally followed in this country, the thought has not been totally disregarded by any means.

It is probable that a few cases of infection of Skene's glands or the urethral follicles could be revealed through a study of the washed sediment of the first urine voided after digital stripping of the urethra The technic of preparation of such urinary sediments is described in the chapter on "Diagnosis in the first part of the book

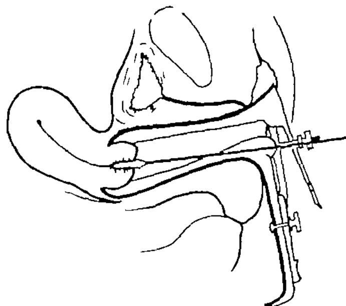


Fig 109—Rubbing a smaller applicator upon the mucosa of the cleansed cervical canal.

Beyond a doubt the introduction of sulfanilamide into the treatment of this disease has complicated greatly the questions of diagnosis and tests of cure Many unfortunate mistakes are sure to be made in both and there is an urgent call for far greater refinement in method than heretofore has been general. There is much to be done in the fields of education among those upon whom patients and society must depend. Cultural methods so far as the gonococcus is concerned have not as yet received the general attention that they deserve It is only through an increased demand for them that great improvement in the average

bacteriologic laboratory is to be expected and this demand must come from us. One makes no mistake when he says that there is only a sprinkling of laboratories today where sufficient attention has been given to differential cultures for this bacterium. That this should be corrected immediately is beyond question.

Unfortunately, hardly any reliance can be placed upon the serologic studies for gonococcal infections as they generally are carried out. And they aid but little more when done in the most ideal of ways. The reasons for this have been considered in the section on the disease in the male.

L. TREATMENT INDICATIONS AND LIMITATIONS

Despite the highly encouraging advances that have been made in the treatment of gonorrhea in the female, it is obvious that much of its treatment for some time to come will rest with local and hygienic measures At its best sulfanilamide scores many treatment failures. The ordeal of prolonged hyperthermia, its cost the difficulty of secrecy in its use its lack of general availability, and the possibility of fatalities all combine to make most physicians hesitant about advising it for their patients, however dramatic may be some of its successes.

Perhaps nowhere in the field of therapeutic endeavor is it more necessary that the physician should have a clear idea of the indications for and the limitations of any type of treatment than is the case with gonorrhea in the female. In her the disease can not be viewed with the equanimity that it engenders in the male In him in the absence of alcohol and sexual excitement it eventually disappears if no treatment is given In her during menstrual life it not only rarely reaches this happy termination within a reasonable time unaided but if injudiciously treated, it carries with it the most devastating of possibilities often it does so under the most careful of treatments.

In the female the disease despite local treatment usually pursues the complete cycle of acute subacute and chronic, whereas in the male this final stage—chronicity—usually is prevented with but little difficulty In fact chronic gonorrhea in him is preeminently a mark of poor treatment or faulty conduct.

We see then in the female a disease the acute stage of which at times is fulminant and fraught with the gravest dangers. As a rule this acute stage is of rather brief duration and merges into a subacute stage carrying with it further possibilities for permanent impairment and frequently characterized by a fluctuation of activity an advance and retreat in the battle between the tissue defensive processes and their unwelcome guests Gradually this oscillation between activity and latency settles into a

stage of chronicity wherein the gonococcus only rarely finds it possible to dwell in the freely draining mucous membrane. It is forced to retreat into the depths of the poorly draining smaller mucous channels of the tract wherein immunity processes seldom develop sufficiently to eradicate it with even a fair degree of speed.

Viewing this march of events in the light of our known therapeutic limitations we find a field wherein caution must season activity, a realm in which we must not blunder On the one hand we observe a susceptible group of mucous membranes struggling to overcome a bacterial invader that has found its natural habitat and, on the other we are faced by the fact that we have no true therapeutic specific that surely gives these tissues the ascendency No only is this the case but it is equally true that the slightest misstep on our part during the height of this battle may be the determining factor in the production of irreparable damage. Wherefore in the present state of our knowledge, we should do well to view the three stages of this disease in three entirely different lights and to realize that each carries therapeutic indications essentially its own. One well might summarize these indications by saying that the acute stage calls largely for masterly inactivity the subacute for guarded activity and the chronic, perhaps for destructive activity

The hope during the first two stages of this disease cycle is that the third may be ushered in without there having been involvement of the fallopian tubes. And so serious is this complication that all of our therapeutic measures should be tempered with that end in view

As in the male there is nothing to suggest that our treatment measures get their value from the direct killing of gonococci, and, yet, it is a fact that many of the local measures still in rather common use seem to be based on no other thought. The true tissue immunity processes seem to get no consideration in these therapeutic attacks. Much of the treatment advised is definitely traumatic and many of the chemicals used would surely in equal strengths cause chronicity of infection in the male. One finds it difficult to understand in view of the fact that the minute pathology of gonorrhea is the same in both sexes why the solu-

tions advised for her disease are usually at least four times as strong as give benefit to the male. And it is probable that a careful study of the treatment of gonorrhea in the female, in the light of what is most obvious in the male, would be instrumental in demonstrating the hurtful potentialities of much that hitherto has been deemed good treatment.

And to what end are these solutions of greater strength used? Almost invariably they are applied only to mucosal surfaces that have much native immunity against gonococcal infections—areas that would recover if they received no treatment, providing their deeply lying feeders subsided. They do not go down into the smaller mucous channels that act as feeders to these surfaces when they do hold gonococcal infection for any great length of time. True, they may bathe their outlets, but it is a long time *since those who thoughtfully treated gonorrhea in the male believed* that bathing the outlet of a prostatic follicle, for instance, with any bactericide influenced the infection in the follicle. And after the acute stage in female gonorrhea, we are dealing with an analogous situation. Treatments based upon such ideas have been instrumental in establishing in the professional mind a false sense of values, of obscuring the clinical picture in such a way as to bring about a degree of skepticism that is not warranted by the true state of affairs and is not to the best interest of those females afflicted with this disease nor to society at large.

Let us then consider the course of the infection in the various susceptible mucous membranes and see what treatment indications we can glean from them. Starting with the vulva we find a mucous surface that may share in the inflammation but does not share greatly in the true infection its response being due to the irritation of purulent secretions and not to true bacterial penetration. Such being the case there obviously is little point in our thinking of its treatment from the standpoint of stimulating its immunity responses for so soon as its feeding glandular foci subside it gets well whether we treat it or not Not only may this be said of the vulvar mucous membrane but it is equally true of the urethra and trigone both of which are lined by mucous membranes rich in either true resistance or ready immunity response

The same cannot be said of Bartholin s or Skene s glands, for not only are they poor in native immunity responses, but these responses are further retarded by their anatomic structure which prohibits good drainage. And as their canals are so minute, there is little possibility during the acute stage of applying substances directly to their mucosal surfaces

Taking these things into consideration it is apparent that, until we find some way of quickly stimulating the immunity responses of these smaller mucous channels, we must recognize the limitations of our present methods of local treatment and pattern our efforts accordingly Hence so far as this lower disease zone is concerned, we are on safe ground if we consider the acute stage of gonorrhea, and perhaps the subacute stage as well, more in the nature of a self limited process, realizing that no matter how energetically we may treat it we do not at this time eradicate the infection in the smaller channels. Such a realization would be productive of a gentler type of treatment than commonly is resorted to Surely one can find in the picture little justification for the use of the strong bactericides. In fact, about the only indication that it presents is an antiphlogistic one wherein one almost forgets the gonococcus and thinks mostly of efforts to relieve inflammation, such as rest, cleanliness, and such local measures as reduce mucosal irritation. At a later day he, of course, must think of eradicating latent, residual infection in the smaller mucous channels, but efforts to do this during the early stages of the disease seem only to add to the severity of the disease, encourage other complications and make later efforts more difficult.

Advancing to our middle zone of infection, the vagina and the cervix, we find that treatment indications do not differ so greatly during the acute and perhaps, the subacute stage. The vagina in the adult is practically immune to gonococcal penetration and therefore bears the same relation to the cervical infection as does the vulvar mucosa to its feeding foci. It recovers without treatment when it no longer is irritated by the cervical discharge often it is not even inflamed by this discharge.

To get even a fair conception of the treatment indications of the acute and subacute stages of gonorrhea of the cervix uteri

one must visualize not only its gross anatomic structure and location, but he must remember its histologic structure And, withal, he must be familiar with its clinical behavior when infected by the gonococcus Primarily he must keep uppermost in his mind the fact that it is the more intimate portal of entry of the gonococcus on its journey to the fallopian tubes and, because of this, it is the most important of all structures in this disease. It is worthy of the most profound respect Being lined throughout most of its extent by tall columnar cells it is very susceptible to gonococcal infection and it would be expected to continue its active infection for a considerable period of time, as is the case with the decidedly similar mucous membrane of the male anterior urethra. It has the added disadvantage not only of being arranged in irregular folds but of being penetrated by numerous narrow tubular glands themselves being lined by the same type of cells and equally susceptible to gonococcal infection. At its upper extremity it is distinctly narrowed and it has the advantage of being lined here by cells almost identical with those of the endometrium which as we have seen are singularly resistant to gonococcal infection. It, thus, would seem to offer a natural barrier to extension of infection by continuity of surface

The canal, unfortunately usually is filled with tenacious mucus which limits its free surface drainage This misfortune is, in a small measure, compensated for by the fact that the alkalinity of this mucus is such that the gonococcus does not live long in it. This, however is probably not of much value during the acute stage of the disease. It is possible that its only real action is to make it more difficult to find the gonococcus microscopically during the latent stages of the disease By the same token it in a measure may offer an explanation of the fact that many women with cervical gonorrhea may indulge in sexual congress many times before they transfer an infection to the male

It is everywhere in evidence that no matter what one applies to an infected mucous membrane he cannot cause it to rid itself permanently of the gonococcus so long as there are small infected mucous channels emptying their gonococcus-laden secretions upon it. It is equally obvious that unless these channels can be made to drain freely or substances that stimulate their local immunity

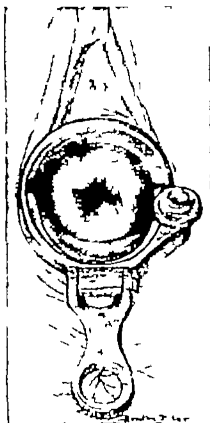
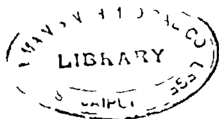
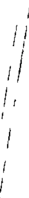


Fig 110 —Acute gonorrheal cervicitis and urethritis The cervix is normal or enlarged. The area surrounding the external os is reddened and congested The reddened area blends gradually into the surrounding normal cervical tissue The urethra is somewhat reddened and the mucosa everted (Courtesy of Dr C C Norris.)





responses can be applied directly to their mucous membranes—a thing obviously impossible in the cervical glands—they do not progress readily toward cure. All of which would raise a distinct question as to the therapeutic value of many of the forms of treatment devised for the gonorrheal cervical mucosa. Surely there is no reason to believe that the call is for strong chemicals during these early stages of the disease. There is reason to believe that the trauma of their application is not best for the surface mucosa, and greater reason to think that they more often retard than encourage glandular drainage thus prolonging infection. Nor is there striking evidence to the effect that their use is overwhelmingly successful even in the presence of latent infection in the cervical glands One might argue that, so far as the surface mucous membrane is concerned these applications would cause the columnar cells to be replaced by squamous cells with their greater immunity Even then we would not have made such great strides toward cure so long as the infected glands remained (see Fig 114)

In the present state of our knowledge regarding the cure of gonorrhea one rather safely might interpret treatment indications in these two disease zones as calling for a profound respect for the natural ability of the infected tissues to pursue rather well their cycle toward latency realizing that too energetic treatment not only will retard this natural progression but often will produce grave complications that otherwise might not attend. Just how much longer this policy of "watchful waiting" must be our safest course one cannot say but certain it is that science has not so far furnished us with any substance that when applied to the local tissues greatly shortens the course of acute and subacute gonorrhea in the female or that prevents gonococcal colonization in the glandular structures and its resultant chronicity of infection And it is equally certain that the literature is replete with evidences to the effect that much of the gross pathology of the disease heretofore has been the result of a too strenuous type of local treatment. Assuredly it is of more importance today that we think first of the harm a given form of treatment can do and secondarily of just how much it may aid the struggling tissues to shorten their battle.

Advancing to our third zone of infection, the uterus and its adnexa, we find even more reason for withholding the therapeutic hand This crowning misfortune carries with it such dire possibilities as to make more worth while the tedious conservatism so appropriate for gonococcal infections below this level, for in such conservatism rests our most valuable means of preventing these female calamities In this zone we see accentuated to the highest degree the call that the physician "be constantly a watchman and a therapeutist only when necessity arises." It is here that the too active hand may be the hand of the executioner

Considering the gravity of such disease extensions it is remarkable what Nature is able to do toward their limitation and cure if she is allowed to do it without interference. It has taken us a long time to realize this and, even today, the knowledge is none too general. Far too many such patients are crowded into surgical ventures that generally cannot be compared in their results with careful nonsurgical measures and that, with unfortunate frequency prove fatal. A long, tedious campaign leading to success is much to be preferred to a short, active one leading to defeat.

It is an interesting fact that in tubal infections as in epididymitis in the male we never have based our treatment on the idea of directly killing gonococci We have been willing to concede some of the glory to true tissue processes though we seem largely to have ignored them in other places. Even in our inconsistency we have shown wisdom, and surely we should do well to magnify our respect for Nature's efforts and so pattern all of our procedures as not to interfere with her in any way For it is only by the avoidance of hurtful local measures and a proper control of the activities of the afflicted female to the end that she does not introduce harmful factors that we can expect to obtain even a small measure of the success that is to be had.

LI. HYGIENE

It is probable that the question of hygiene is of even more importance in the female than in the male so far as the question of serious complications is concerned And there can be no doubt about its being of equal importance in the promotion of cure. Unquestionably the female gonorrheic is far more influenced by excessive physical activity even during her intermenstrual period than is the case with the male and this influence and its dangers are enormously accentuated during and immedi ately before and after menstruation. Her immunity processes do not differ essentially from those of the male and are as easily influenced adversely by the same things that so markedly retard his curative responses. Thus alcohol and sexual excitement are to be most carefully avoided.

Rest in bed should be insisted upon during the early stages of the disease whenever possible and it is far more important during menstruation. Where cervical infection exists, efforts should be made to prevent uterine contraction by the oral administration of tincture of hyoscyamus or belladonna or its derivatives. The latter are particularly indicated in the presence of a narrowed cervical canal as a means of relaxing the cervix to promote better uterine drainage and thus reduce the dangers inherent in increases of the intra-uterine pressure. They are equally so in the presence of retroversion of the uterus. Heat to the lower abdomen often exercises a relaxing effect upon the uterus and is of benefit.

Attention should be given to the bowels where necessary and the patient should be instructed in regard to cleansing the parts as well as the hands as prophylaxis against conjunctival infection. She should be warned of the dangers of introducing such things as enema nozzles thermometers and suppositories into the rectum, particularly in the presence of a profuse discharge.

By the social nature of things it often is much more difficult to control in her the matter of sexual excitement, and even inter

course, than is the case with the male, over the months so commonly necessary for cure After the acute stage she commonly is so devoid of local symptoms as to furnish her with little obvious reason why she must curtail her activities for so long a period of time as is necessary for her own safety and that of others. All too often she returns to her former activities despite the physician's prohibitions and frequently during such indulgences her infection smoulders on in an inactive state infecting others and, seemingly not greatly harming herself Urged by sentiment, desire, fear of detection or economic necessity she often does not show even a small portion of the concern for others that motivates her brothers. She lives in the hope that she will not transmit her infection to others but often devoid of the determination not to do so Some become vindictive because they have been infected and deliberately transmit the disease, an attitude practically never encountered in the male.

The difficulty of keeping many women under treatment until cured is by no means a light one. In order to save the home from disintegration it often is necessary or wise to carry out treatment with the patient in complete ignorance of the true cause of her trouble Under such circumstances, it commonly is a matter of extreme difficulty to keep the patient to the strict hygienic régime so urgently needed To continue the treatment of such patients to the point of cure requires a confidence in the physician that is none too commonly held A large percentage of such patients stop treatment long before there is any reason to suspect that cure has taken place

Among many younger women there is the belief that the disease cannot be transmitted to the male unless the penis is passed into the vagina Thus on stress of occasion they pose as virgins to avoid such intromission. The male gets gonorrhea and the physician wonders why his "perfectly behaved patient does so poorly with her gonorrhea. So frequently has the writer treated patients infected by these supposed virgins that he usually tells his younger patients of this great danger

LII. A DISCUSSION OF METHODS USED IN THE TREATMENT OF THE FEMALE

It is an undeniable fact that within the last few years many of the older hurtful methods used for the treatment of the female either have fallen into rather general disuse or, if used, more attention is given to their possibilities of doing as much harm as good. That some of them continue to be used by those who are none too well versed in the ways of the disease and the common causes of largely avoidable complications gives value to a consideration of these procedures and their proper use, regardless of the fact that the subject has been covered in a general way in the chapter on "Treatment Indications and Limitations."

The Vaginal Douche.—At its best, the vaginal douche does no more than cleanse, perhaps increase patient comfort through cleanliness and gentle heat, and allay vaginal and vulvar irritation. Its stimulation of curative responses in both the cervical and vulvar zones must be slight indeed. Against these slight and problematic values stands the great danger inherent in the procedure. So many clinical surveys have shown that patients in whom douches have been used have an overwhelming percentage of tubal involvements that many of the most careful students of the subject sweepingly condemn their employment during the acute and subacute stages of the disease. Many of them even go so far as to say that they should not be used at all. That there is value in heeding their warnings is shown by the fact that, in those semipenal institutions where douches are not given it is decidedly rare for patients to develop tubal infections who did not have them before they reached the institution. Against this stands the high incidence of such disease extensions in those clinics wherein douching is advised. Assuredly one cannot explain this great variation in numbers by the fact that the one group is under better hygienic control than the others. Usually treatment by douches was discontinued in the above institutions because of the common occurrence of tubal involvement.

Certainly if douches are to be given or prescribed, every effort should be made to remove from the procedure those factors that make it so hazardous. The ease with which fluids under even moderate pressure can be forced into the fallopian tubes and beyond, in some patients, has been cited in the chapter on "General Considerations." It was there pointed out that this was far more easily done in those patients with a gaping os uteri from any cause. Mention also was made of the fact that retroversions of the uterus carried in themselves potential dangers of tubal infection and that these dangers became definitely increased if high-pressure vaginal douches were employed

It therefore, is obvious that the danger of the vaginal douche rests solely in the extent to which it applies force to the cervical canal and that routinely to advise patients to use douches is a grave error Never should douches be ordered without the most



Fig. 111—Nonpressure vaginal douche nozzle Devised by the author as a means of prevention of high intravaginal pressure from faulty methods of douching Not only is great pressure impossible but the stream of water is projected laterally instead of directly at the uterine opening

careful instructions to the patient and the absolute knowledge that the instructions are thoroughly understood In order to avoid too high an intravaginal pressure it is imperative that the top of the fountain from which the fluid flows be not more than 2 feet above the vaginal level. Even this amount of pressure may be too great in those patients with a small vaginal outlet or who do not relax the perineal muscles Certainly douches never should be used with the patient in other than the prone position and before they are used the physician should inspect the cervix to determine the character of its opening

In order to avoid entirely the possibility of increases in intravaginal fluid pressures the writer some years ago devised the speculum-irrigator shown in Fig 111 By use of this it is possible to direct fluids upon the cervix without pressure In

situ it washes only the anterior vaginal wall, but it is a simple matter to withdraw it slightly and, by gentle rotation while the fluid is flowing to cleanse the entire vagina.

As bactericidal value of the solution used is a matter of no moment, it is wise to use only those things that exert no tissue irritating or devitalizing influences. Solutions of sodium chloride, boric acid or 1 8000 potassium permanganate given at a temperture of about 110 F are as efficient as any

Topical Applications—It requires but little familiarity with conditions holding in gonococcal infections of the vulvar and cervical zones to suggest that more harm than good can be done by the topical application of chemicals to them. Perhaps in no real beneficial way do these things influence the deeper glandular infections to which the continuation of the surface evidences is due. It is true of infections of the urethra in the male, and it is probably more so in the female that chemicals cannot be applied by applicators or like methods to the gland openings in such a gentle way as to fail to interfere with their drainage and thus increase the likelihood of chronicity Not only do such methods prolong the period of infection in the male, but it largely was the result of such things that strictures of the urethra were so common before these practices were rather generally discontinued.

It is probable that no amount of chemical treatment to the surfaces where empty Skene's, Bartholin's and the endocervical glands would influence the infections in their depths. The trauma of the applications, if frequently used, would cause the building up of many layers of squamous cells as a protective measure. This process would be greatly increased if strong chemicals were used As a result of this thickening of tissue there would be brought about a condition wherein free gland drainage would be prevented and intermittent drainage that greatest of all causes of chronicity would be the only type possible (see Fig. 114)

It is an extremely fortunate circumstance for women that much of the futile harmful poking and prodding into infected regions has been discontinued And it largely is because of this that the prognosis of gonorrheal infections in them has improved so greatly during the last decade. It is the opinion of most

thoughtful gynecologists that both urethral and cervical gonorrhea do better and get well more quickly if topical applications are avoided.

Tampons.—It is probable that vaginal tampons, if they do not retard cervical drainage and do not carry chemicals that are of an irritating nature, do no great harm. It also is equally probable that they do no great good. From his experiences with such substances in the male, the writer would raise a serious question regarding the use of glycerin or other hygroscopic fluids to the cervix or its canal. Such substances, even when injected into the urethra of the male with the utmost gentleness, almost invariably make a change for the worse in the clinical course of the disease and precipitate a degree of chronicity taking months of careful treatment before cure is obtained. Even so seemingly innocent a thing as 5 per cent sodium chloride solution injected and held in the male urethra for five minutes on as many consecutive days has a like action

Urethral Injections.—Owing to the anatomic position and structure of the female urethra it is by no means so simple a matter to give her urethral injections without running the dangers of traumatizing tissues, as is the case with the male. The valid arguments against such medications are that (*a*) the canal usually recovers just as well without them, (*b*) the probable trauma from their use retards cure (*c*) the use of chemicals of far greater strengths than are wise has a like effect After the acute stage cystitic symptoms are unusual and the urethral discharge if any is kept up by feeding foci rarely influenced favorably by such injections

Heat.—The most widely used mode of the application of heat to the lower urogenital tract is by the use of hot hip baths or sitz baths These are of great value both for the effect of their heat and for their vulvar cleaning action during the acute stages of the disease The heat is soothing to the irritated nerves reducing discomfort for some hours thereafter in many patients and there can be no doubt that it commonly has a beneficial action upon the infectious process Indeed, there are those who claim such baths should be the only local treatment for gonorrhea in the female during its acute and subacute stages.

And their results, both from the standpoints of disease course and scarcity of complications, are far better than are those that come from clinics where many other things are done to the pa tient. There are those of wide experience with many plans of treatment for gonorrheal vulvovaginitis in children, who have abandoned practically all such efforts and confine their treatments to hip baths.

In the taking of such baths, which should last for from fif teen to thirty minutes the water should come as high as the crest of the ilium and should be kept at a temperature just bear able to the skin. Hot water should be added from time to time to maintain this temperature. The baths should be used from one to four times in the twenty four hours

During the early stages of pelvic involvement it is common practice to use heat by means of the hot water bag, electric pad, hot towels, or the far less cleanly hot poultice.

The Elliott Method of Applying Heat—By the use of the Elliott apparatus it is possible to apply to these structures a much higher degree of heat than is obtained by the use of hip baths. Not only is there more heat but it can be kept at a constant temperature or changed at will. The fluid pressure within the latex bag by which it is applied can be regulated to suit the case. The apparatus consists of a machine with a thermoregula tor for temperature control and an arrangement for fluid pressure control. From this, tubes pass into the specially constructed latex bag and the water is kept flowing constantly Either a vaginal or a rectal bag can be used though the former is pref erable.

Prior to the introduction of the bag the vagina should be cleansed. The water is allowed to distend the bag and is held at the proper dilating pressure, usually about 2 pounds. The temperature of the water is regulated at about 110 F at the start and is raised gradually to 125 or 130 F The treatments usually are given daily last for one hour and the patient is made to rest for at least one-half hour thereafter

While all gynecologists are not in accord regarding the great value of such treatments at all stages of the disease there is rather general agreement that it is a most valuable means of using

controlled heat. Curtis[1] states that, 'Some patients cannot endure the adequate distention of the bag and are therefore not adapted to the *Elliott* treatment for in such instances efficient radiation of heat is not obtainable. Opinions vary, but it is generally agreed that this form of therapy is not well adapted to the most acute stage of gonorrheal disease.'

Of its use in the pelvic involvements of gonorrhea R. C. Doan and W M Simpson[2] report as follows "One hundred and one patients with pelvic inflammatory disease were treated. Good results were obtained in 67 23 per cent, fair results in 24 75 per cent and poor results in 7 92 per cent. In 52 cases including chronic salpingitis, acute exacerbations of chronic salpingitis, acute and subacute salpingitis good results were obtained in 67.31 per cent, fair results in 23 08 per cent and poor results in 9 61 per cent.

Hyperpyrexia.—In the glowing reports regarding the value of prolonged fever as a curative agent for gonorrhea one seldom encounters the reverse side of the picture He senses that there is such a thing when he reads that the method should be tried only by experts and in a hospital wherein an adequately trained personnel is present and that it only should be used on "suitable" patients. When he talks with patients who have had such treatments he begins to realize that it must be somewhat of an ordeal in which many patients go dangerously close to the pearly gates, *some hear the hinges creak, and some just stop hearing forever* Of course reports of fatalities are to be found in the literature but as it takes considerable courage to advertise such things, it is probable that they are by no means so rare as one is led to suspect. *For instance the writer himself knows of 14 unpublished deaths from this cause.* When he compares this with the fact that he has never had a male patient die from gonorrhea and his knowledge that comparatively few females do, he has to admit to a deep disinclination toward advising prolonged hyperthermia for his male patients no matter how long their infections might continue And though he admits its curative value in the

[1] Textbook of Gynecology W B Saunders Co p 151
[2] Am J Surg 28: 78 1935

graver complications of this disease, he finds that even here he would rather try safer things first in the female.

Such an attitude does not in any way impugn the value of the procedure. It is born solely of a deep interest in the patient and his future, an interest that deplores the placing of the patient's life in jeopardy for the cure of things that seldom warrant the taking of such risks. To subject patients to it, whether male or female unless their lives or futures are greatly menaced by the disease, is to assume a responsibility that seldom is justified with a disease that often will disappear if we let it alone. And in view of the fact that many of the reported fatalities have occurred in unusually robust patients who is it can say which is a "suitable" case? Assuredly "The longest way 'round is the sweetest way home"—and the safest.

Many methods have been devised for the raising and maintaining of body temperature. Around 1912 this was done in Germany by the prolonged immersions in hot water but, aside from killing a number of people who otherwise might have lived many years it got nowhere

Later malaria inoculations were tried. Some good results were reported, but the method largely was abandoned because the malaria was harder to bear and was more dangerous than the gonorrhea.

Experiences with malarial inoculations, however, led to the investigations of other methods of raising body temperature until today there are a number of cabinets and similar things that lend themselves to the perfect control of almost everything but that decidedly tenuous thing called 'life Perhaps the best of these is the Kettering hypertherm, and it is with this that most of the best controlled experimental work has been done.

By the use of these procedures body temperatures can be raised to the desired level and maintained there for many hours. There is no trouble at all in raising body temperature by such means, but every once in a great while the patient's heat centers act up and his temperature keeps on going up Some few of these survive but most do not.

As one analyzes the reports of those who have done most work along these lines, he finds them divided into two schools.

On the one hand are Carpenter and Warren who determine the thermal death time of the patient's gonococci and regulate the duration of the treatment to accord with it. On the other are the great majority of workers who pay no attention to thermal death time but proceed at once with sessions of hyperpyrexia *(from 106 to 107.2° F.) lasting for five to ten hours and given* every second or third day barring definite contraindications. The numbers of such treatments range anywhere from 2 to 12 or more in number. Surely these latter patients follow no short or sweet way to cure. And, when one multiplies the number of treatments often given by the number of days from treatment *to treatment and adds to that the time required to cure the fre*quent failures, he is prone to wonder if the time saved really is worth the hazards entailed.

The writer is firmly of the opinion that it is a mistake to use this form of treatment upon the general run of gonorrheal patients. He sees rare good sense in the previously mentioned *pronouncement* of Carpenter and *Warren* to the effect that the procedure should be reserved for only those patients who resist cure by other methods.

Vaccines.—This subject has been considered in that section having to do with gonorrhea in the male and there is no reason to believe that any exception to the views expressed need be modified in any way for the female.

LIII. THE TREATMENT OF ACUTE VULVAR AND CERVICAL ZONE INFECTIONS

From our experiences with the use of sulfanilamide in the male, one would expect it to have the same influence upon the disease in the female He would expect some dramatic results some mediocre results and a good share of failures. And even in the presence of the most prompt clearing up of symptoms he should be even more cautious about the pronouncement of cures It always should be borne in mind that the female far more often becomes a symptomless gonococcus carrier than does the male, and the criteria of cure in her should be, if possible, more exacting. As these factors together with sulfanilamide are fully discussed elsewhere there is no need that they be considered further here.

It is probable that one should use much smaller doses of this drug in most females than so commonly are administered to ambulant male patients. And there should be exercised all of the precautions that are demanded by the frequent toxic reactions. Though there are a few reports upon the use of this drug in the female there is not so much known about it as is the case with the male In fact, most of the reports that have appeared have had to do with its effect upon the pelvic complications rather than upon the early stages of infection In the male, it is safe to say that the patient who is not relieved practically of all symptoms of the disease within a week of the commencement of sulfanilamide administration rarely if ever is influenced very favorably by its further usage. Though not certainly known it is probable that the same rule can be applied to the female and that, if her symptoms have not been markedly improved in a week, the drug might just as well be discontinued. Certainly the following of such a rule would be instrumental in reducing much of the toxic picture resulting from prolonged dosage

Thus unless there are definite reasons why sulfanilamide

should not be given, it probably is best to try it for a week in doses of not over 45 grains per day If, by the end of that time, the improvement is not far greater than would be expected without sulfanilamide, it is best to discontinue it. If, on the other hand there is such improvement, it should be continued in dos ages of from 20 to 30 grains per day for several weeks if an absence of toxic reactions allows

So far as the local treatment of acute infection in these two zones is concerned, it probably should be most marked by its absence Careful cleansing of the introitus and hot hip baths are preferable to douches and local applications Experience has shown that treatment limited to these simpler procedures carries far less danger of tubal zone infection and makes treatment of the later stages of the infection easier and of shorter duration Nature has proved herself an excellent physician for the patient with acute gonorrhea in these regions and she does her best work where *she is interfered with least. All that one really should* hope to do is to carry patients through the first few weeks of the infection without the occurrence of complications of gravity Unless sulfanilamide cures the patient, she is never free of infection when the acute stage subsides no matter what local measures have been tried. And she rarely does so well eventually if she has been given local treatments directed at either her urethra or her cervical canal. More often she is left with conditions that assure her a long stage of chronicity

Thus, one might summarize the situation by urging Deaver's masterly inactivity" during this period or Hare s saying that The physician should be constantly a watchman and a thera peutist only when necessity demands." And seldom at this stage does there arise the need for an activity that so often proves more meddlesome than helpful.

The patient should be urged to rest as much as possible, to spend the days of at least the first two menstruations in bed and to adhere closely to those hygienic measures outlined in the chapter on "Hygiene." Aside from the matter of physical hy giene there enter into the question the patient s mental attitude toward the disease the doctor and the treatment and he who loses sight of these factors is shortsighted indeed In them

rest his ability to gain a measure of the patient's confidence that will win co-operation both in treatment and conduct. Beyond these is the fact that home future happiness and a large segment of disease prevention often depend upon just what occurs at the first contact between the doctor and the patient. It is

INSTRUCTIONS FOR FEMALE PATIENTS

Gonorrhea in the female almost always is curable if the patient co-operates with her doctor. It usually attacks the regions marked A and B. The aim in treatment is to prevent the passage of the disease to the fallopian tubes marked C. Even if it does reach the tubes, however, it is practically as curable but the cure usually takes longer.

The most common causes of the passage of the infection to the fallopian tubes are vaginal douches, painful menstruation, too much physical activity—

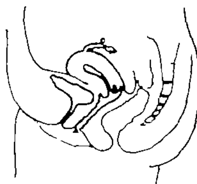


Fig. 112

particularly at or near a menstrual period—and unwise treatments to the opening of the womb.

The disease rarely can be cured in a reasonable time, often not at all, in patients who drink any alcoholic liquors or beverages (whiskey, beer, wine and like things), indulge in either sexual excitement or sexual intercourse, who repeatedly take long automobile rides or who ride a bicycle or on horseback. The symptoms usually disappear long before cure has taken place and cure can be determined only by the most careful laboratory studies. Infection can be passed to others as long as there is a single germ of the disease present.

much more hazardous in the female than in the male to let this first opportunity for mental training for the things ahead pass by without attention. The art of the practice of medicine demands more than this in such psychic states as so commonly follow the knowledge that gonorrhea is present. Without atten-

tion to these matters, patients seldom lend themselves to what has been termed masterly inactivity in treatment. They are prone to follow the lure of speed and seek doctors who, in their words, "do something" about the matter It takes much patient education and confidence in her medical attendant's knowledge of things to make a woman contented to do so little particularly if she knows that the man who infected her is getting daily treatments.

Among dispensary patients and even among office patients, time can be saved and usually a better understanding conveyed to the patient if some such diagram as appears in Fig. 112 is laid before her and explained in simple language The more she really understands about her infection, its commonly avoidable complications and the prognosis of it all the better patient she will be and the surer is she to pursue treatment until cured

Acute Infections of Bartholin's Glands—It is probable that gonococcal infection of the ducts leading from Bartholin's glands is of frequent occurrence Just how far along the duct such infections go as a rule is difficult to determine, as one gets an opportunity to study microscopic sections of them only when they have been removed together with the known infected gland. If however one safely may trace analogies between these and the behavior of other similarly constructed glands and their emptying canals he is forced to the conclusion that these infec tions do not usually reach the gland itself As examples of such infection behavior stand out the ejaculatory ducts and the ducts of Cowper s glands. It is true that Bartholin s glands more commonly are infected than any of the structures to which these other ducts lead as is shown by more frequent abscess forma tions in them

In most cases of infection of Bartholin s glands abscess for mation takes place And in the presence of gonorrhea, there seldom is much doubt in the diagnosis of them. The development of a tender painful mass in the greater labium the redness of the skin the common distortion, the usual mild temperature elevation and the increased leukocyte count are highly diagnostic. Upon rare occasions hernia or cyst formation may inject elements that could mislead. The former are soft and give an

impulse on coughing while the latter is a freely movable, globular mass that rarely is tender Neither gives local pain or elevates the leukocyte count.

Treatment—Whenever possible, incision should be avoided, as some infections resolve Those that are incised even though

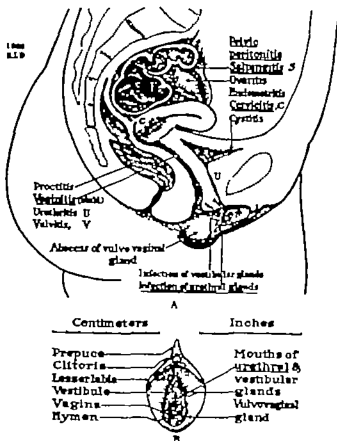


Fig. 113—A is an anteroposterior section which shows the various locations of infections and of inflammations, also pelvic adhesions in nullipara. B is the vulva, showing locations of the openings of the three sets of glands. (Courtesy of Dr R. L. Dickinson.)

great care has been taken to secure adequate drainage for a sufficiently long period of time, show a decided tendency to recur Also the gland frequently establishes drainage through its duct and remains as a focus of chronic infection. Schumann advises

their surgical extirpation while acutely infected, while Curtis prefers drainage where necessary with extirpation after the acute inflammatory evidences have subsided

Those who hope for a subsidence of the abscess without rupture or incision generally make use of the ice-bag, while others apply heat to hasten its breaking down.

Abscesses of Skene s, the Urethral and the Vestibular Glands.—Abscess formation in these small glandular structures is not altogether uncommon. This is particularly so of Skene s glands, is less so in those of the urethral, and is rather rare in the vestibular glands. It is probable, however, that there are many follicular abscesses in the female urethra that escape discovery

Abscess formation in either of these structures is rare in those patients who have escaped topical applications to the urethra. Indeed this fact together with the avoidance of the production of further pathology and the encouragement of chronicity of infection, is the main reason why such things should be avoided in the acute stage of the disease. To these could be added the further fact that such measures rarely if ever do more good than harm.

Occasionally abscesses of Skene s glands burrow along under the urethra for some distance, and follicular abscesses may penetrate that canal and burrow beneath it or may rupture into the vagina. The vestibular glands rarely abscess and, when they do their presence is likely to be overlooked in the submental swelling

Treatment—Abscesses of Skene s glands should be incised and drained. Those of the urethral glands that show definite evidences of pointing into the vagina should receive like treat ment. Round palpable masses along the urethra that show no evidence of pointing toward the vagina probably are better left to the patient s curative processes. Like such infections in the urethral follicles of the male some few rupture into that canal but most go on to resolution and self-sterilization. They remain as minute shotlike bodies along the canal and safely may be dismissed from further consideration. Certainly incision of them from the urethral side is not so easy as it might seem and just as certainly few if any of them require it.

LIV THE TREATMENT OF CHRONIC VULVAR AND CERVICAL ZONE INFECTIONS

ONE perhaps should start such a discussion by some criticism of the word "chronic." For it has come to mean several things and should bear with it a definition of just what it is intended to convey In the male, it has come to mean infections that have lasted for from three to six months or more. In the female it has been more loosely applied and in the writings of many, seems to cover every stage following the acute stage and a more or less brief subacute stage. This from the standpoint of indicated therapy, is a definite misfortune. For there is, following the stage of most activity an often prolonged stage wherein treatments applicable to the late, quiescent stages may be a distinct menace to the patient. Just how long this period is varies with different patients but in the minds of most clinicians it extends over at least four weeks, more often eight weeks, and occasionally longer

During this early quiescent period the disease has almost explosive possibilities. It usually can be stirred into an activity even far in excess of that of its preceding acute stage. Despite the subsidence of marked inflammatory activity the battle is by no means won And the least indiscretion on the part of either the patient or the physician may start it raging again. Though the patient may be highly desirous to be cured, the disappearance of both subjective and objective symptoms on her part is prone to cause her to become somewhat lax regarding her hygienic restrictions, which in no sense brings the battle between her gonococci and her tissues to a hasty termination. On the other hand the physician highly desirous to produce a prompt cure often is led to do *just those things that the tissues cannot stand*

Of the various stages of gonorrhea this probably is the most trying to manage. During the acute stage the patient frequently is so uncomfortable that she is willing to do just what she is told to do Also the physician knows that there are many things

that he must not do Where tubal infection takes place the disease divides itself into two such cycles, the second phase of each demanding a degree of co-operation and patience upon the part of the infected that does not always continuously hold, and a degree of staying of the therapeutic hand that is in no sense easy for her physician.

The wise physician does little, if any, more during this period than he dared do in the acute stage To try to hurry things by additional local treatments usually is progress in reverse. Not only do such methods at this time usually defeat their purpose, so far as speed of recovery is concerned, but they frequently are potent factors in the causation of other complications. Seemingly it would appear perfectly safe to let the patient entertain herself and feel that she was doing something real in cure promotion by allowing her to use vaginal douches. And yet, it is during this period of such seeming safety that most tubal infections occur and a large percentage of them occur in patients who use douches. Perhaps no method of treatment has had its value more overrated. They cleanse the vagina it is true, but *to what real purpose? The vagina has a way of emptying itself* so promptly that it never is a retarding influence to cervical drainage. After the acute stage the vaginal mucosa seldom is irritated greatly by the cervical discharge. What irritation there may be usually is solely confined to the introitus and can be dealt with better by the cleansing properties of hot hip baths particularly if the labia are held apart during the bath Unquestionably the value of the vaginal douche in such patients is more a psychic than a real one

One who has had much experience with gonorrhea is forced to admit that one of the most valuable things for the patient is moderately frequent contacts with her physician And if such office visits demand the doing of things beyond mere local examination to keep the patient interested in her disease and its treatment those things should be of the most innocuous nature One can find no suggestion of harm in mild applications to the intravaginal portion of the cervix, but a decided question could be raised about the innocuousness of efforts to cleanse the cervical canal for the sake of making largely futile and often harmful

applications to its mucous membrane There can be little if any objection raised to the use of nonirritating applications to the



Fig 114.—Chronic inflammation of cervix. In this microscopic section we again see the most favorable of conditions for chronicity of infection and, perhaps, an indication that the use of strong chemicals in the cervical canal tends to produce epithelial changes that even further increase the possibility of prolongation of infection It will be seen that the gland openings are becoming further occluded by the conversion of columnar epithelial surfaces into ones covered by stratified squamous cells This change is more commonly Nature's way of protecting herself from chemical irritants, rather than being a product of untrammelled gonococcal infection (Courtesy of Dr W P Graves.)

introitus, but many reasons can be found why the urethra usually does far better if left to its own curative efforts. Under proper circumstances harmless local treatments are not deceptions of

the patient. Their value to her mind frequently is worth far more to her than their cost to her in dollars. And, not uncommonly, they are far more effective in keeping her under hygienic control than are words alone. This is particularly true in dispensary practice, where patient-doctor understanding and confidence are usually at their lowest ebb And it even is frequently so under the better conditions holding in private practice.

What one really is trying to do is to control the activities of the patient during this rather comfortable phase of the infection to the end that she does not indulge in those things that prolong her infection and are so potent in the causation of the graver complications of the disease The doctor cannot prevent gonococcal colonization in the smaller mucous structures in these two zones and he must await the time when it is safe to destroy these limited areas in most of the patients who have failed of cure from sulfanilamide.

It is probable that the time of safety for the destruction of these structures in the vulvar zone is reached much sooner than is the case with the endocervical glands. In the latter it is general opinion born of much grief, that they should not be attempted even in the mildest cases until the infection has been present for at least three months Efforts at endocervical cauterizations and the like before this time not infrequently cause the development of pelvic cellulitis.

Destruction of Skene's Glands.—There are several methods by which these glands either may be destroyed or removed. Perhaps the simplest of these is by means of the introduction of a wire or blunt needle to the depths of the glands and subjecting them to the action of the high-frequency fulgurating current. Wollheim has devised a special syringe for this purpose By it one may inject an anesthetic solution into the channel and later fulgurate it.

Some have advised the injection of cauterant strengths of silver nitrate for this purpose The writer's experiences with this method in the treatment of para-urethral sinuses in the male however have not been such as to make him think highly of its efficiency He has injected both 50 per cent silver nitrate and strong tincture of iodine into them and obtained gonococci from

them after a week or ten days. These may destroy the surface cells but they surely do not destroy the gonococci that lie beyond them.

Curtis has suggested the passage of the blunt ends of curved surgical needles into the depths of the glands forcing them

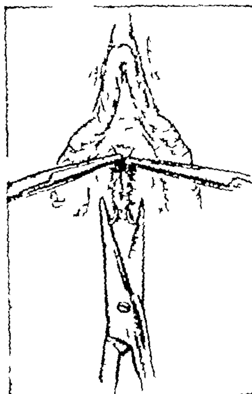


Fig. 115.—Curtis' method of surgical removal of Skene's ducts. The blunt ends of the curved needles are passed to the depths of the tubules and forced through the vestibular mucous membrane. The mucous membrane is slit between them, after which the needles are pried sharply outward through the incision and the tubules are removed by snip of the scissors. The opening is then closed by catgut sutures. (Courtesy of Dr. A. H. Curtis.)

through the vaginal surface and snipping off the entire gland structures with the scissors (Fig 115)

It is probable that the cure of infections in these glands could be accomplished by the frequent injection into them of 5 per cent mild protein silver in the way so efficient in the treat

ment of parafrenal gland infections. The openings of Skene's glands however are such minute things as to make repeated injections decidedly difficult. The writer has found it possible to clear up infections in the vestibular glands by this method.

Destruction of the Endocervical Glands—As has been said it is unwise to make any efforts toward destruction of tissues in this region within less than three months of the beginning of the infection. There are several methods by which destruction in

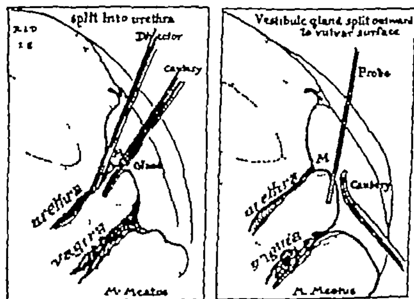


Fig 116—Treatment of rebellious infections of urethral and vestibular glands by the fine cautery wire On the left a grooved director is held in the urethra, and the gland is split upward on the right a duct too fine for the platinum loop is located by a slender probe and the hot wire cuts down onto it. (Courtesy of Dr R. L. Dickinson)

this region usually can be carried out without the resort to such surgical procedures as the Sturmdorf operation of cervical conization.

One may accomplish this in some cases by means of linear fulgurations upon several occasions This method has the advantage of causing less scar tissue for later contraction than do those that depend upon actual cauterization.

The most common means employed for such destruction prob-

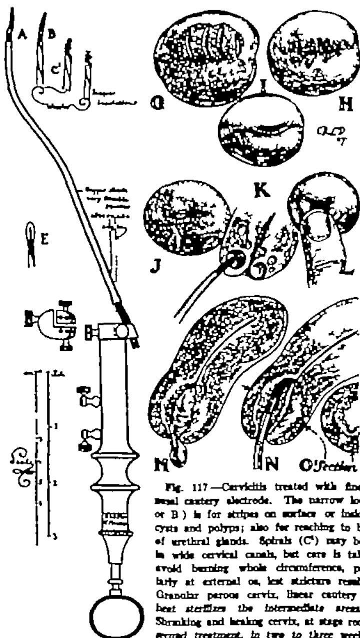


Fig. 117—Cervicitis treated with fine wire nasal cautery electrode. The narrow loop (A or B) is for stripes on surface or inside, for cysts and polyps; also for reaching to bottom of urethral glands. Spirals (C') may be used in wide cervical canals, but care is taken to avoid burning whole circumference, particularly at external os, lest stricture result. G, Granular porous cervix, linear cautery. The heat sterilizes the intermediate areas. H, Shrinking and healing cervix, at stage requiring second treatment, in two to three weeks. I, Healthy surface with formerly everted lips now inrolled and precluding need of repair. J, Cystic disease, one cyst opened by cautery tip, contents pouring out. K, Section with wire entering. L, Palpation of deep cyst. M, Obstinate infection deep in canal. Thus mucus must be cleared completely and any narrow external os stretched to enable the cautery as in N to burn two or three deep grooves from top to bottom of canal through gristly and cystic lining, shown in section in O. In N one gutter is made; one is begun. (Courtesy of Dr. R. L. Dickinson.)

ably is by the use of the regular nasal cautery (Fig. 117) If this method is used the cautery should only be passed about two thirds into the canal so that there is no destruction at the level of the internal os. It is safest to cover not more than one third of the circumference of the cervical canal at one sitting. The cauterizations should be made from above downward and should be sufficiently deep to reach the underlying musculature Subsequent efforts are best delayed until healing has taken place The procedure usually can be carried out without anesthesia.

Hyams has devised a wire loop for the electric semiconiza tion of the cervix which has given excellent results in his hands and those of many others He destroys the entire gland bear ing portion at one sitting. By this method it usually is possible to avoid the necessity for the Sturmdorf operation even in the most intractable cases.

Following the Hyams method of destruction of the mucosa in this region, there commonly occurs a vaginal discharge lasting usually for only a short while. Upon the separation of the slough, bleeding, usually small in amount, is likely to occur It seldom is sufficient to require treatment, but it is wise to tell the patient of its likelihood of occurrence to avoid anxiety upon her part.

Several months after all such procedures a sound should be passed into the cervix to determine the caliber of its lumen. As stricture formations are of comparatively slow development, it is wise procedure to repeat such a study at the end of a year

Curtis has warned against cauterization in those patients having a retroflexed uterus in the following words "Nasal cau tery knife treatment of the infected canal is particularly danger ous in patients with retrodisplacement of the uterus the sloughing tissue burned detritus tends to pass upward carrying infection to the upper genital tract"

Bartholin's Glands —As the surgical removal of these glands has been considered elsewhere there is little point in repeating it here Suffice it to say that the local treatment of these glands and their ducts is an almost impossible task and in the presence of chronic infection they had best be removed surgically Of course, it is entirely possible that repeated kneading of the glands between the thumb and finger might result in cure in some cases

just as it does in the presence of Cowper's gland infections. The writer however knows of no reports upon such a method and doubts if it has been tried to any great extent. Certainly it is as simple a procedure as is massage of Cowper's glands and there is little reason why it should not be given a trial before surgical excision is resorted to. The same procedure usually brings about cure in chronic infections of Cowper's glands after about six weeks of massage applied twice a week.

LV THE TREATMENT OF TUBAL ZONE INFECTIONS

As repeatedly has been stressed, the first call in treatment of these graver extensions of gonococcal infection is for prevention. And unquestionably most of them can be prevented by a little more education on the part of the patient and the employment of better treatment methods than sometimes are indulged in.

In the presence of salpingitis the patient should be placed in bed and, even though sulfanilamide failed to control the disease in the early stages, it is wise to try another course. There have been reported remarkable results from this drug in the early stages of tubal involvement so remarkable that unless previous toxic influences have been marked, it is deserving of a trial under far more favorable circumstances offered by a patient in bed.

Ice bags to the suprapubic region, attention to the bowels, free use of liquids, an ample diet fitting the degree of fever, and such sedatives as may be needed for the relief of pain and the securing of restful sleep are among the things most needed during the first week or two of the condition.

Where available, heat therapy may be resorted to It, however should not be viewed as a minor procedure but its dangers should be weighed as against those of the complication for which it is advised. Some workers rate its value in salpingitis as high as 80 per cent, while others have had far less success with it. There can be no doubt, however that it has a definite field of usefulness in this complication

The Elliott treatment likewise has been of great value in these cases. This method has been described in the chapter on "Methods of Treatment." Many clinicians are of the opinion that it should not be used during the acute stage

In lieu of the Elliott treatment some advise the use of the Priessnitz dressing as the infection abates and many use the simple heat cradle having a single electric bulb.

Under the best of circumstances the patient should remain in bed for at least a week after the temperature reaches normal

and she should be in bed during the next two menstruations. Though recurrences of symptoms may take place they are far less likely to do so if she avoids sexual intercourse and strenuous physical activity during her convalescence

Under an expectant plan of treatment such as the above, most women go on to gradual recovery without resort to surgical intervention Indeed, the treatment of gonorrheal salpingitis is even more completely nonsurgical today than it was surgical in the days when it was felt that such intervention offered the patient her best chance for recovery Whether or not the presence of the possible aftermaths of tubal infection require surgery is a matter to be considered only after the gonorrhea has been cured.

Even the practice of the intravaginal incision of purulent pockets in the cul-de-sac is now rarely done it having been found that most patients do better if left to their own curative efforts. Curtis has shown beyond any doubt that the gonococcus soon disappears from these accumulations as well as from the tubes from which they obtained their gonococci. And it is far better to leave any crippling of the pelvic viscera that these things may cause to a safer period when operations can be done with deliberation.

LVI THE MANAGEMENT OF GONORRHEA IN THE FEMALE

Procedures Recommended by the American Neisserian Medical Society May 17 1938

THE SOCIETY makes the following recommendations in regard to the management of gonorrhea in women

1 Diagnosis

This should be based on—

History Presumptive of gonorrhea (symptoms)

Exposure to known cases of gonorrhea.

Infection of another person with gonorrhea.

Clinical evidence—including complete physical, abdominal, pelvic, and rectal examinations.

Findings in stained smears.

Other laboratory findings in doubtful cases (especially cul tures)

Complications—such as rheumatism, arthritis, salpingitis, and ophthalmia.

Every adult female with acute arthritis or pelvic inflamma tion should have bacteriologic examinations to determine a possible gonorrheal etiology Patients with vulvar pruritus dysuria, or leukorrhea should also have bacteriologic examinations for gonorrhea

A blood Wassermann should be taken in all cases of gonor rhea in the adult.

The clinical diagnosis has been so amply covered by the third article published by the Neisserian Medical Society of Massa chusetts [1] on the management of gonorrhea that it will not be discussed at length at this time.

Method of Examination and Technic for Films—The presence of the gonococcus should be sought for in all suspicious cases. Public laboratory examinations of films should preferably

[1] The Management of Gonorrhea, III The Clinical Diagnosis of Gonorrhea in the Adult Female New England J Med Boston, May 2 1935 212: 823

be depended upon as a check-off and not substituted for examinations by the physician with his own microscope.

The patient should not use a douche, irrigation, or any vaginal medication for twenty four hours prior to examination. Urination should be abstained from for at least two hours previous to examination

The patient should be placed in the dorsal or lithotomy position Bartholin s glands and the urethra, including Skene's glands and their openings should be inspected and palpated under a good light. The amount and character of the discharge should be noted and specimens for bacteriologic examination secured. The exits of Bartholin s glands are cleansed and the glands "milked" to secure a droplet of secretion. The external urinary meatus should also be cleansed, and the urethra similarly 'milked" paying especial attention to Skene s glands These are situated in the floor of the urethra, their exits being just within the external urinary meatus. They are also "milked and a droplet of secretion so obtained.

A bivalve speculum is used to expose the cervix. No lubricant should be used on the speculum before introducing same unless absolutely necessary The external os which is usually covered with a tenacious mucus, should be cleansed with dry cotton, and with a sterile platinum loop mounted on a glass rod or with a cotton-wound applicator the specimen is secured from within the canal. A heavy walled medicine dropper the tip of which has been drawn out into a capillary tube 2 to 3 cm. in length is also an excellent instrument for this purpose since by its means an extremely small droplet of secretion may be secured and transferred to the slide without inflicting unnecessary trauma to the specimen. Occasionally the disease is confined to the urethra or to Bartholin s glands and in this case care must be exercised not to carry the infection to the cervix.

Gonorrhea of the rectum should be looked for by the routine examination of smears obtained by proctoscopic examination.

Two films should be prepared from each suspected area, and should be stained. The Gram stain should be employed routinely Gonococci are gram negative

The examination of stained films is the most common method and also the most rapid method of demonstrating the gonococcus. When film examinations are negative they should be repeated. Negative film examinations often become positive if repeated in twenty four hours, as the trauma incident to securing the material for the first bacteriologic examination will often cause sufficient reaction to result in more organisms being brought to the surface and therefore available for demonstration. The application of an irritant such as silver nitrate has the same effect.

Cultures upon Artificial Media—Cultural methods when performed by a skilled bacteriologist are invaluable and *culture is the only absolutely certain method of differentiating the gonococcus*

Complement Fixation Test—The Society has no recommendation to make regarding this test.

2 Prophylaxis

Patients should be informed of the infectiousness of the disease and must be given detailed instructions regarding prophylaxis for others as well as for themselves

3 General Care

It is important to build up the patient s general resistance and health. Sexual stimulation and sexual intercourse must be guarded against. The patient should be instructed regarding the adverse influence of excessive physical exertion, and if possible, during menstrual periods should rest in bed Alcohol is forbidden

4 Treatment

It should be remembered that the acute stage of gonorrhea in women lasts for only a short time whereas the chronic stage is often prolonged If gonorrhea is carefully and thoroughly treated during the initial stages and reinfections can be prevented the course of the disease can be considerably shortened. In chronic cases that have been improperly and carelessly treated and in those with recurrent infections the prognosis for a rapid cure is decidedly less favorable. Much depends upon whether

the infection has traveled above the internal os. Once the disease has passed into the uterine cavity and attacked the fallopian tubes, symptomatic cure becomes less likely, since adhesions are likely to persist even after the infecting organisms have disappeared.

Local Treatment—Gonorrhea of the lower genital tract is often either overtreated or undertreated The use of strong germicides and antiseptics has been proved to be not only useless, but harmful Furthermore, such applications may result in extension of the infection to areas above the internal os and predispose to the development of metastatic lesions The ideal gonococcide would be one that would destroy not only the gonococci upon the surface, but also those in the depths of the tissues without causing injury to the adjacent cells. *There is no specific for gonorrhea after the gonococci have gained access to the deeper tissues, but cure may result from the development of an immunizing process within the body*

Cleanliness mild local applications with proper drainage and avoidance of reinfection, trauma irritants or congestion form the logical basis for local treatment. During the acute stage no intravaginal douches should be given external irrigations are recommended.

Acute Gonorrheal Infection above the Level of the Cervix.—When the infection extends from the cervical mucosa to the corporeal endometrium, extension to one or more commonly both tubes, occurs in almost every instance and develops almost simultaneously

The treatment of acute infection of the fallopian tubes should be essentially nonsurgical. The only indications for surgical intervention during the acute stage are

1 An abscess which may be safely evacuated without traversing the peritoneal cavity

2 Failure of prolonged conservative treatment.

3 A pelvic peritonitis which is becoming general.

4 Rupture or torsion of an inflamed adnexa.

As a matter of fact the above indications are very rare There are many reasons for conservative treatment.

The disease often cures itself and operation often entails

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Cleanliness is essential. Local applications to urethra, vagina and cervix are helpful. General medical supervision must be given and surgical or other types of treatment when indicated.

Chronic Skenitis.—Electrocoagulation or the injection of a drop or two of phenol with blunt-tipped needle.

Chronic Cervicitis in the Adult Woman.—If local chemical applications fail to cure, the cervix may be treated with the electric cautery The cautery should be a small instrument of the nasal type. Great care should be used not to cauterize as far as the internal os.

Cauterization.—Cauterization of the cervix in the case of children with gonorrheal vaginitis is a dangerous procedure and not to be recommended ordinarily

Chronic Bartholinitis.—This is best treated by excision of the entire gland but this should not be performed during pregnancy

Treatment during Pregnancy.—The treatment should be adapted to the stage of infection and the degree of advancement of the pregnancy and be continued with great care up to the time of delivery Too vigorous treatment should be avoided during pregnancy for fear of causing abortion or premature delivery

Treatment Preceding Delivery.—For a week or two prior to the expected delivery an effort should be made to destroy surface organisms and thereby reduce the number that may be present at the time of labor

Delivery.—During labor two points should be borne in mind (1) prevention of upward spread of an infection which has previously been limited to areas below the internal os and (2) protection of the infant. At the start of labor after shaving off the pubic hair the external genitalia and adjacent parts should be painted with a 5 per cent tincture of iodine solution or with a solution of 4 per cent aqueous alcohol-acetone mercurochrome These should not be used for instillation into the vagina. Two ounces of a 4 per cent aqueous solution of mercurochrome should be instilled into the vagina with an asepto vaginal syringe Strict asepsis and antisepsis must be employed. Intravaginal instrumentation or examination should not be done unless absolutely necessary Intracervical manipulations are dangerous, and for

this reason operative delivery by means of forceps or version is to be avoided and employed only when absolutely necessary If the delivery is slow, more of the 4 per cent aqueous solution of mercurochrome should be instilled into the vagina. The head of the delivery table should be elevated, and such inclination of the patient should be maintained for a week after delivery If, in the interest of the mother or child, vaginal operative delivery, such as forceps or version, must be resorted to, the patient should be placed in the recumbent position with the head and trunk elevated and a copious vaginal douche of a weak solution of potassium permanganate given without force, immediately before the operation. If during the course of delivery, it has been necessary to enter the uterine cavity, it is the rule of some authorities to administer an intra-uterine irrigation of sterile salt solution or a weak potassium permanganate solution immediately following the procedure All intra-uterine irrigation, however, is probably best omitted except in special cases.

Delivery of the placenta should be spontaneous, and when possible even the Credé method of expression should not be done.

Firm contraction of the uterus and free drainage are especially desirable after delivery of the patient who has gonorrhea. One quarter or ½ ampule of obstetric pituitrin may be administered as soon as the head is born followed by ergot in quantities large enough to cause contraction of the uterus. Small doses of ergot should be given for seventy two hours after delivery

Under hospital conditions immediate repair of lacerations should be done and care employed to avoid carrying the infection into uninvolved areas.

Care of Child—The Credé prophylactic treatment of ophthalmia neonatorum should be carried out routinely

Vulvitis and Vulvovaginitis Neonatorum—The external genitalia of all female infants born of mothers suffering from gonorrhea should be cleansed with absorbent cotton moistened in boric acid solution and the parts carefully dried The genitalia may then be painted with a 1 per cent solution of silver nitrate, and care should be exercised to prevent later infections.

Sulfanilamide—Recent experience indicates that the administration of sulfanilamide may be of considerable value in treat

ing acute and subacute gonorrheal infections in women. Because the effective administration of this form of therapy is attended by certain risks we advise hospitalization of patients so treated with careful observation (blood counts, etc.) during treatment. If definite improvement does not follow sulfanilamide therapy in five days it should be discontinued. Sulfanilamide should not be used in pregnancy nor immediately following delivery

Fever Therapy.—This should be a hospital procedure. It is safe only in experienced hands.

5. Criteria for Cure

The tests for determining whether a cure has been effected depend upon clinical signs and bacteriologic tests.

Treatment should be *continued for two weeks after* the disappearance of all clinical signs of the disease and the disappearance of gonococci as indicated by careful film examinations made from the secretions from Bartholin's glands, Skene's tubules, and the cervix. Films should show less than 12 to 20 per cent pus cells. Then treatment should be stopped Reexamination by means of films and clinically within two weeks thereafter at monthly intervals, preferably immediately after the cessation of a menstrual period, or following intentional traumatic or chemical irritation to cervix and urethra. If at the end of three and one-half months, four negative clinical and film examinations have been secured, cultures are made and if these prove negative the patient can probably be regarded as cured. As an additional safeguard, however, two additional culture and film examinations are repeated at monthly intervals twice more at the end of which time, if these prove negative and no clinical manifestations have developed, the patient may be pronounced cured and marriage may safely be undertaken. If during this period of observation evidence of reinfection develops, treatment is resumed and the entire test of cure is later repeated.

The development of evidence of infection after the three-and-one-half month period of observation is rare and is more frequently due to reinfection than to a recurrence provided the tests have been carefully carried out.

Confrontation should not be attempted routinely, but the patient should be questioned as to source of infection and, when possible the contacts should be examined Certainly in all cases of gonorrhea in married women an effort must be made to determine the condition of the husband and secure treatment for him if necessary It is hopeless to treat women who are being reinfected

LVII. GONORRHEA IN IMMATURE FEMALES

Since the writing of the present edition of this book our views of gonorrheal vaginitis in children has been brought to almost a right-about face by the studies of the New York Vaginitis Committee. This committee under the chairmanship of Dr Robert M Lewis and composed of Drs. R. A. Benson Alfred Cohn, Arthur Steer and Eleanor L. Adler set out to make a careful study of the entire subject of vaginitis with the most astonishing results, so far as our older views on the subject are concerned.

As a member of the Research Advisory Committee on the Study of Gonorrhea for the New York City Board of Health it has been the writer's privilege to follow the work of this committee minutely from its second meeting. The first meeting was given over to planning the work. After this the committee held its meetings with the General Advisory Committee with extremely interesting results to the author At this early meeting there was the general conviction that gonorrheal vaginitis was so common that there would be no difficulty whatever in finding countless cases for study The unreliability of smear diagnosis caused the committee to lay down the rule that the gonococcus must be demonstrated in culture before a diagnosis was made.

At a meeting several months later the writer was surprised to hear that a large majority of the cases formerly assumed to be gonococcal vaginitis were something else and that only a small number of true cases had been gotten under study At the third meeting the situation had become somewhat acute and it was suggested that a request be sent to other hospitals to lend cases in order to obtain enough for a study of proper size for the drawing of conclusions.

When one considers this experience in the light of former general views together with the fact that all that has been needed to keep a child out of school was a vaginal discharge he senses the injustice that must have been done (and still is) to thousands of children of school age Certainly comparatively few of them really had gonorrhea and just as certainly we thought they had

Most assuredly a new day has dawned for these unfortunate children afflicted with this disease as well as that formerly larger percentage who erroneously were believed to have it. And the author finds it exceedingly difficult to curb his superlatives in speaking of those whose labors have ushered in this brighter period Particularly is this so regarding Lewis to whom we owed what for a while seemed the answer to the question—hormonal therapy For this later work was carried out under his chairmanship and through it all none has been more interested in proving the error of this view than he Seldom has the author seen a finer example of the true spirit of science than Lewis has shown by his untiring efforts toward the revealing of truth despite the fact that it gradually reduced the supposed value of the treatment for which he had received so much honor and recognition Would that Medicine had many more such men Because they mark a definite milestone in the history of this infection the illustrations of Lewis and others upon the action of the hormones are left in the present chapter though many might consider that we had passed them in our march of progress

So much has this committee learned in the last two years about gonorrhea in the immature female that what follows that is different from our older views is taken from their findings It belongs to Lewis Benson Adler Steer and Cohn. It must be viewed as their contribution to the subject and in no sense that of the writer who feels highly honored to have been privileged to sit in with others during their deliberations and plannings. Countless children of the present and future their parents, Boards of Education and Science owe them much. If in what follows each discovery of theirs is not attributed to them by name it is because they have so thoroughly upset most of our former views that it would cause such a constant repetition of names as to make the telling of the story decidedly unwieldy Consequently the reader is referred to their writings, that undoubtedly will appear before the present chapter is in print. Before this seeming dismissal however tribute should be paid to the Commissioner of Health of the City of New York Dr John L. Rice whose interest in the subject caused him to locate the funds that made the studies possible His deliberations with the committee

have added much in knowledge and inspiration. Without his help the work would not have been accomplished.

Etiology—For generations so far as these young sufferers are concerned, we have attributed to the gonococcus possibilities of getting about that we strenuously have combated in their elders We have assumed, because of their poorer anatomical protection and the fact that so many of them were cared for by others, that *accidental infections were the rule and that other modes of transference* at least in small children, were the extreme rarity We have maligned the toilet seat which because it was voiceless, could not give us the lie. We have accused bed and other linens that were equally silent. We have insisted that infection could pass from mother to child simply because they slept in the same bed We have believed many other equally unlikely things rather than dig into more unpleasant possibilities that are in accord with what we really know about the spread of this disease And, now the time is here when we must discount these theories and beliefs and view most infections from an entirely different and far more sensible angle. It is the same old gonococcus and it does *not change its ways just because its victims are young* It dies when it meets soap solutions and it has not yet been cultured from dry bed linen True, Cohn upon several occasions has recovered it from a thick drop of pus seemingly dried upon a glass slide but that is a far different thing from pus dried in the meshes of fabrics. The writer knows of no one who has been able to culture the gonococcus under these latter conditions. For which reason we undoubtedly are on safe ground if we conclude that in some way pus still moist must be placed upon a susceptible mucous membrane for the transmission of the disease Obviously this conveyance can be made by means of thermometers or other instruments that are used on the infected and then upon others before *complete drying has taken place* Indeed, Nelson and others have studied hospital infections where the use of the same rectal thermometer upon a number of children in rapid succession was the means of transmission.

So far as schools and other places are concerned it is apparent that the much maligned toilet seat must be given a clearer title to innocence Benson and other members of the Vaginitis Re

search Committee were unable to find a single case of toilet-seat infection after a year's observation in institutions where infected and noninfected children repeatedly used the same toilets despite the fact that the seats were of the old closed front variety Nelson and others have failed to find such transmission in school children though there were infected children and well ones using the toilets in rapid succession during the period of recess. Upon one occasion out of many trials Cohn was able to culture the gonococcus from the toilet-seat smeared with culture medium and used by a number of children proved to be infected. No member of either committee has knowledge of a school epidemic of gonorrhea that could possibly be attributed to toilet-seat infection Where such infections had occurred it was possible to uncover other modes of transmission more in accord with the known habits of the gonococcus.

The closer the transmission problem is studied the more commonly does direct sexual transmission appear in the picture And *it will not do to assume that this applies to only the older of these* children. Miss E P Rice as quoted by Lewis found that of fifteen infected children eight had had sexual contacts with men or boys The ages of these children were as follows five years 1 six years 3 seven years 1 nine years 2 and twelve years 1 As would be expected such events are not simple to reveal but others interested in child psychology have shown that many of our formerly supposed accidental infections resulted from sex tampering of one kind or another This is as one familiar with the ways of the gonococcus would expect.

As we turn to infantile infections other things enter the picture some of which are in a measure explained by our experiences with estrogenic substances in the treatment of such infections as well as the knowledge that these studies have revealed It has been shown that for a short period after birth the child carries from its mother a degree of hormonal protection that would prevent the occurrence of active evidences of infection Just how long this influence lasts is not known but the present belief is that it is limited to perhaps the first two weeks of extra uterine life. That it frequently may exert a longer influence in the sense of bringing about a prolonged asymptomatic carrier state is sug

gested by the following quotation from Lewis "Dr E A Mac Leod in a study as yet unpublished throws new light on this situation Following a group of forty-seven girls who were born of mothers with gonococcal infections when delivered, she found thirty-eight of them yielded positive spreads at some time during the first eighteen months of life. Of the thirty-eight only fifteen showed clinical evidence of infection before the age of one month. Eighteen of them first showed clinical evidence of infection in the period between five and eighteen months after birth.

These studies by MacLeod were carried out by smear methods alone and it is probable that cultures would have increased the percentage of infections greatly and would have shown that more of those who remained symptom-free for longer periods were in reality gonococcus carriers. Such studies, in all probability would remove much of the mystery from those infections presenting symptoms even as late as two years after birth or perhaps longer

There is comfort in the fact that older children very rarely convey infections to the eyes and that puberty rarely fails to terminate the infection.

The possibility of recrudescences of vaginal discharge or true reinfection of the vagina as the result of persisting rectal infection must be taken into consideration despite the seemingly proved fact that rectal gonococci gradually tend to disappear even in the absence of any treatment. The Vaginitis Research Committee, as cited later on found rectal infection in upwards of 40 per cent of vaginally infected children as late as the sixteenth week of the disease

Bacteriology —Cultural studies carried out by the previously named committee and others have done much to clarify the situation so far as the discovery of the gonococcus in younger females is concerned. The presence of Gram negative cocci around the female genitalia that easily could be and commonly are assumed to be the gonococcus is by no means a rarity Indeed beyond the early acute stages of the infection such diplococci were found so commonly that the committee early set up the rule that the only safe means of diagnosis rested with such cultures. This criterion was the means whereby it was shown that the larger number of

diplococci in numbers enveloped in leukocytes. We must abhor *such things as single staining methods*, such as methylene blue as repeatedly has been pointed out herein. We even might investigate the iodine solutions in the laboratories upon which we rely for our Gram staining method for unless they are right the possibilities for error are enormous Into such diagnoses there also enters our old friend personal equation, which well deserves being reckoned with

When there is little discharge lessened signs of inflammation and where what discharge that is present is thin and watery we would do well to base our diagnosis only on cultures And when it comes to the determination of cure we would do well to abandon all thoughts of smears and cling to cultures alone

Prognosis—In a large measure we would do well to discard what we previously supposed was the prognosis of gonococcal infections before the age of puberty We of course may cling to the belief that puberty itself almost always brings about spontaneous cure The studies of the Vaginitis Research Committee have shown that much of our former pessimism regarding cure in the younger of these victims is hardly warranted In their studies they ran a control group of cases wherein no treatment was used and, much to their surprise 78 8 per cent of these patients underwent spontaneous cure in twenty-eight weeks or less

Unquestionably many of the former prolongations of infection or what seemed to be prolonged infection were matters of local treatment and not gonorrhea. Also then as now many of the supposed recrudescences or recurrences were new infections.

By the use of the newer sulfonamide drugs the outlook for prompt cure is almost if not quite as good as is the case with gonorrhea in the adult To some extent the carrier problem still plays a part and it is for the discovery of these asymptomatic carriers that prolonged observation and frequent cultural studies should follow supposed cure.

Treatment—So far as the treatment of gonorrhea in female children is concerned things have moved with striking rapidity It was but a few years ago that Lewis gave us the estrogenic treatment which at first seemed to be a most remarkable answer to the problem for these little victims of an unkind fate Though

gested by the following quotation from Lewis "Dr E. A. MacLeod, in a study as yet unpublished throws new light on this situation. Following a group of forty-seven girls who were born of mothers with gonococcal infections when delivered she found thirty-eight of them yielded positive spreads at some time during the first eighteen months of life. Of the thirty-eight only fifteen showed clinical evidence of infection before the age of one month. Eighteen of them first showed clinical evidence of infection in the period between five and eighteen months after birth."

These studies by MacLeod were carried out by smear methods alone and it is probable that cultures would have increased the percentage of infections greatly and would have shown that more of those who remained symptom-free for longer periods were in reality gonococcus carriers Such studies, in all probability would remove much of the mystery from those infections presenting symptoms even as late as two years after birth or perhaps longer

There is comfort in the fact that older children very rarely convey infections to the eyes and that puberty rarely fails to terminate the infection.

The possibility of recrudescences of vaginal discharge or true reinfection of the vagina as the result of persisting rectal infection must be taken into consideration despite the seemingly proved fact that rectal gonococci gradually tend to disappear even in the absence of any treatment. The Vaginitis Research Committee, as cited later on found rectal infection in upwards of 40 per cent of vaginally infected children as late as the sixteenth week of the disease.

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cases of vaginitis formerly supposed to be gonorrhea were, in reality, nongonococcal conditions. This demonstration is of the utmost importance and shows the extent to which undeserved stigma and restraints have been visited upon a large percentage of these unfortunate children.

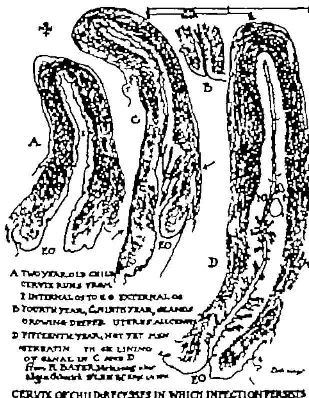
Pathology—So far as the question of pathology is concerned there still are some important gaps in our knowledge There con tinue to be two schools of thought regarding the involvement of both the cervical mucous membrane and the urethra. The more closely these problems are studied, the less reason is there to be lieve that either of them play any great part in the infection. Several uteri removed from children dying while gonorrhea was present and active have failed to show any evidence of extension into the cervical canal. Certainly Fig. 118 shows a lack of cer vical development in younger children that should do much to dis courage such extension In older children glandular development is such that endocervical infections seem more likely to occur However if such extensions were common they most assuredly would not escape detection by careful clinicians and it is largely these who deny cervical involvement. The same applies equally to infections of the urethra Rectal involvement is by no means rare, the gonococcus being found by culture in quite a large per centage (60) during the period of profuse vaginal discharge. After this acute stage the number of demonstrable rectal involve-ments reduces to around 40 per cent by the sixteenth week and then undergoes a rather rapid diminution until it reaches zero

Extension of infections to the fallopian tubes is of extreme rarity and probably only occurs as the result of vaginal washing under high pressure

Symptoms—As with the disease in adult females the symp-toms vary widely During the first two years of life as has been pointed out, the gonococcus may be present without producing any clinical symptoms whatever

During the acute stages of infection there commonly is much redness of the vulva and introitus with much purulent discharge in which the gonococcus is demonstrated with ease There may be some elevation of temperature accompanied by malaise Itch ing and burning may be prominent symptoms

Following this acute stage the disease usually shows a tendency to subside into a period of lessened clinical symptoms which often may be increased by overactivity on the part of the child or other things. The discharge becomes thin and watery instead of thick and yellow, and reduces in quantity as the activity of the inflammation subsides. There may be days or weeks in which



CERVIX OF CHILD-RECESSES IN WHICH INFECTION PERSISTS

Fig 118.—(Courtesy of Dr Robert L. Dickinson.)

there are few if any symptoms followed by a recrudescence of all of them.

Diagnosis.—If we would overcome much that is unfair to many children and hew closely to the line of scientific exactness we must be far more careful of our diagnostic methods than we now generally are. In the acute stages we still may rely rather well upon smear methods if they show typical Gram-negative

diplococci in numbers enveloped in leukocytes. We must abhor such things as single staining methods, such as methylene blue as repeatedly has been pointed out herein. We even might investigate the iodine solutions in the laboratories upon which we rely for our Gram staining method for unless they are right, the possibilities for error are enormous. Into such diagnoses there also enters our old friend personal equation which well deserves being reckoned with

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Prognosis—In a large measure we would do well to discard what we previously supposed was the prognosis of gonococcal infections before the age of puberty We of course may cling to the belief that puberty itself almost always brings about spontaneous cure The studies of the Vaginitis Research Committee have shown that much of our former pessimism regarding cure in the younger of these victims is hardly warranted In their studies they ran a control group of cases wherein no treatment was used and much to their surprise 78 8 per cent of these patients underwent spontaneous cure in twenty-eight weeks or less.

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By the use of the newer sulfonamide drugs the outlook for prompt cure is almost if not quite as good as is the case with gonorrhea in the adult To some extent the carrier problem still plays a part and it is for the discovery of these asymptomatic carriers that prolonged observation and frequent cultural studies should follow supposed cure.

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Lewis gave it to us he was far more conservative in his claims than were some of those later investigators who saw in it almost 100 per cent of perfection—a fact that today must be a source of much satisfaction to him. For it was largely because of this conservatism and a healthy measure of skepticism that he was anxious to pursue the matter much further This as has been said, he and his committee most brilliantly have done. However his original work has far too much of historical and medical value to be dismissed from this recital.

Feeling that the disease in such children was confined almost entirely to the vaginal and vulvar mucosa and knowing that it almost always spontaneously disappears when the onset of



Fig. 119.—Vaginal epithelium of infant two and three-quarter months old. Autopsy specimen. In general but little change in thickness of layers is noted up to about ten years of age. (R. M. Lewis, Am J Obst & Gynec., Oct., 1933. C. V Mosby Co Publishers.)

puberty institutes certain mucosal changes he set about producing these changes by the use of estrogenic substances. At first he used subcutaneous injections of these hormones but, having caused some unpleasant by-effects in some children he turned to the use of vaginal suppositories instead. These he formerly had tried and abandoned but, following the report of TeLinde and Brauner[1] he again turned to that method of administration.

By means of biopsies he soon was able to demonstrate that these immature tissues very rapidly changed to the adult type as can be seen by Fig 119 120 and 121 He also demonstrated that within a short time following the cessation of such treatment

[1] Am J Obst & Gynec 30: 521 935

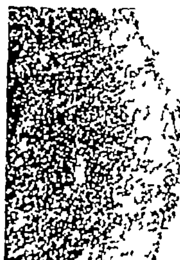


Fig. 120.

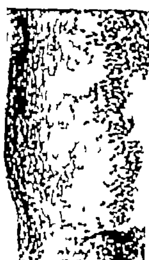


Fig. 121

Fig 120.—Vaginal epithelium (biopsy) Case 6 before administration of theelin. Note the leukocytes between the epithelial cells.

Fig 121.—Vaginal epithelium at tenth day of theelin administration (Case 2) (R M Lewis, Am. J Obst. & Gynec., Oct., 1933 C V Mosby Co Publishers.)



Fig. 122—Vaginal epithelium (Case 2) six weeks following termination of theelin administration Involution is almost or wholly completed (R M Lewis, Am J Obst. & Gynec Oct., 1933 C V Mosby Co Publishers)

the mucous membranes (Fig 122) returned to conditions normal to the age of the child Also he discovered that biopsies were

not necessary to prove the change to adult type, as stained smears of the vaginal secretions showed the presence of large numbers of desquamated squamous epithelial cells when this had taken place (Figs. 123 and 124)

In his first work Lewis was of the opinion that cure was brought about solely by virtue of the histologic changes in the mucous membranes. Later he was brought to the conviction that there were other factors at play Following the thought of Döder

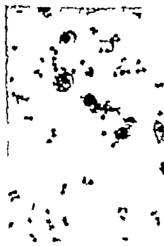


Fig. 123

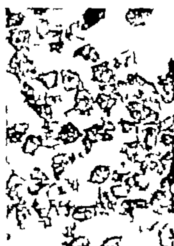


Fig. 124

Fig. 123.—Vaginal smear before treatment with theelin

Fig. 124.—Shows character of vaginal smear in a case seventeen days after treatment with theelin was begun Note abundance of desquamated epithelial cells with pyknotic nuclei. (R. M. Lewis, Am J Obst. & Gynec Oct 1933 C. V Mosby Co Publishers.)

lein that the acidity of the adult vagina was a great factor in vaginal immunity to gonococcal infection, he began a study of the *p*H of the vaginal secretions of the child These he found to be practically neutral in reaction but after the administration of the hormonal treatment they turned sharply acid sometimes reaching as low as a *p*H of 4 0[1]

All in all, these studies were a decidedly bright page in the history of this disease in female children and served to attract

[1] Lewis and Weinstein Surg., Gynec & Obst 63: 640, 1936

an enormous amount of attention to the problem The great misfortune was that, though the child was rapidly relieved of all symptoms and the smears usually were persistently negative thereafter, the later cultural studies carried out by the Vaginitis Research Committee showed that most of these seemingly cured children were in reality, symptomless gonococcus carriers And, so today the treatment stands almost entirely as a means whereby the symptoms can be removed rapidly but in which not too much reliance can be placed in the question of true cure despite negative smears. Unquestionably such a pronouncement should be given guardedly unless it also is supported by a number of cultural studies over a period of at least three months following the disappearance of symptoms. For the above committee was able to *demonstrate by culture the presence of gonococci for periods* equally as long as are required for spontaneous cure in the absence of all treatment.

Perhaps the most interesting thing brought out in these studies was revealed in those little patients used for controls and to whom *no treatment whatever was applied* *Much to the committee's* surprise, 78.8 per cent of these untreated children became culture negative in twenty-eight weeks or less and remained so for the entire time of the study This is exactly what should have been expected if anyone had gone to the trouble of doing a little clear *minded expecting* *Certainly the writer allowed current thought* to turn him in the wrong direction for he recalls having written some years ago that the mucous membranes of these little children largely lacked the power to muster up a true curative response All the time they had been trying to develop the response and no one gave *them a chance to do other than protect themselves* against an endless assortment of insults bearing the name "treatment. *Indeed the author must admit that even as late as five* years ago he had his doubts when he heard Dr Nels Nelson insist that the only good plan of treatment that would cure all cases in *less time than others was just plain hot hip baths* And Nelson was perfectly correct until the sulfonamide drugs came along but we—we were too busy with other things that had better reputations as gonococcicides to even check up on his treatment.

And now most of this as a certain gentleman of brown

derby fame would say is out the window' The doubts have been most beautifully cleared up by this committee's experiences with the various sulfonamide drugs. It first was shown that from 30 to 50 per cent of the cases could be cured promptly by sulfanilamide. Then it was demonstrated that upwards of 90 per cent could be cured by sulfapyridine. And even a higher average of cures were to be had from the administration of sulfathiazole, *which drug by virtue of its greater lack of toxicity was the ideal* one to employ

There are several schemes of dosage advised for the treatment of these children who stand these drugs well. Benson's plan was to give an initial dose of one grain per pound of body weight up to 40 pounds and then ¼ of that dose four times a day The Research Group used ⅓ grain per pound of body weight in 6 divided doses each day Treatment was continued for about ten days, barring severe reactions With sulfathiazole there were no reactions necessitating a discontinuance of treatment. While it is beginning to appear that even shorter periods of dosage down to five days may be equally as efficacious it perhaps is best, *with our present safe knowledge, to choose the longer period until* much more study has shown the equal safety of the other

Thus has a decidedly unsavory chapter of misguided medical endeavor been entirely rewritten to the great gain of all concerned By its recasting can be terminated much that has been socially unkind, though never intended as such No longer need school authorities shiver every time a case of gonorrhea is revealed among their female children For unless they do so by actual sexual contacts or digital tampering they are not going to infect others. Most certainly they are not going to do so through the intermediary help of the much maligned but comfortably useful toilet seat, even though it be of the archaic well worn closed front variety *They can even improve upon this by modernizing* the places where their students go in droves during recess. Of course it may be and probably is good sense to keep children out of school during a period of profuse vaginal discharge but present day treatment can reduce this period to not more than a week in almost every case After that, though the child requires treatment and observation she is most certainly not a menace to

those around her in school where children get little opportunity for two and two contacts If she is a menace to her playmates it is through contacts more intimate than school hours afford and at times and places over which the school authorities have no direct jurisdiction In a more sane and humane interpretation of just these things rests the cure for many an educator's headache as well as many a restricted child s heartache

We always have had and probably always shall have children who are unduly interested in the persons of others and themselves little experimenters and explorers who help the gonococcus to get around quite a little. Also we have older children and adults of the male persuasion who do considerable tampering among those too young to understand or to say "No" And these often serve as busy planters of gonococci on decidedly virgin soil It is as *protection against these predatory and pseudopredatory animals* that parents and children are kept together until the latter are supposed to be able to "fly alone Despite this provision of Nature and Society the wily gonococcus does occasionally enter home circles and the wise educator will get more in comfort from looking in these directions and standing his ground than is likely to come from allowing his own domain to be falsely accused in this regard

Part Three

THE MEDICAL PROFESSION AND GONORRHEA CONTROL

LVIII. THE PROBLEM

THOSE who see only an occasional case of gonorrhea are prone to think rather lightly of it as a national social problem. Even those who see many cases seldom think of the matter from the standpoint of its great danger to others. For the development of what has been called "social consciousness" has not reached universally a very high state among either the urologists, the gynecologists or in fact, general practitioners. Many reasons for this have been discussed in other places, but nowhere is there given what could be called a real excuse for so decidedly myopic an attitude on the part of such a large percentage of physicians. With a national campaign for the control of this disease and syphilis facing us, it is highly important that every one have some conception of the enormity of the situation. We must learn to look far beyond the individual patient who happens to have the disease and visualize the endless chain of infections that eventuated in his disease and the perhaps equally endless chain that may follow if we are lax in our treatments or patient education and control.

No pen could trace a fraction of the human misery that has been and may be the outcome of the single strain of gonococci that brings the patient to us. On through the ages it has blinded babies, maimed women and wrecked men. It has saddened lives, broken homes, denied the right of parenthood and killed. And, unless we rise to the situation in all of its aspects, it will continue on its devastating journey

Gonorrhea, in its spread follows so closely that of syphilis that case-finding studies of the latter can be used for gonorrhea as well. And few demonstrations of the way in which syphilis

spreads have been more dramatic than that shown in Fig. 125 from Parran's book "Shadow on the Land." Of almost equal interest in this regard is Fig 126 showing the result of a case-finding study of the Minnesota Department of Health It would be difficult to find a more striking evidence of the fact that these diseases are exacting an enormous toll from mankind and that many of the paths converge toward our doors. They also throw into strong relief the great need for case and contact searching,

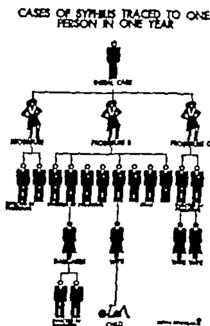


Fig 125—(Courtesy of Dr Thomas Parran, "Shadow on the Land, Reynal and Hitchcock, Publishers.)

in the directing of which much of the responsibility must fall upon our shoulders

Many efforts have been made to determine just how much gonorrhea exists among our population. To one even slightly familiar with this disease it at once becomes obvious that this is a task of almost impossible proportions Not only does the great secrecy in which this disease generally is held make accurate statistics impossible of attainment but there are many other factors which add to the difficulties of such efforts. Perhaps the

greatest of these have to do with the druggist and charlatan. Of less importance is the number of patients who seek neither of these sources of "treatment' but care for themselves in one way or another Added to these is the fact that many females and a smaller number of males have gonococcal infections that either go untreated or are treated as something else.

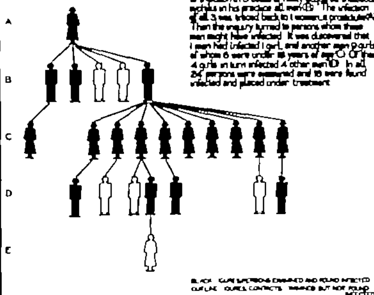


Fig. 126

Because of these many factors making for uncertainty it has been the custom to determine how many cases were under medical care, as shown by a one-day survey and to estimate beyond those figures. Many such surveys have been carried on in dif ferent parts of the country by both the United States Public Health Service and the American Social Hygiene Association.

By such a method figures have been obtained from 39 000 med ical sources in communities ministering to a total population of 29,000,000 From these it safely can be assumed that at least 1 037 000 new cases of gonorrhea each year are seen by recog

NEW CASES OF SYPHILIS AND GONORRHEA COMPARED WITH OTHER COMMUNICABLE DISEASES IN THE UNITED STATES DURING 1938

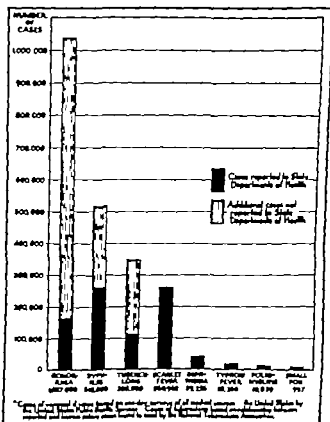


Fig 127

nized medical agencies. In Fig 127 can be seen a comparison of this number with the average annual incidence of other contagious diseases.

It is probable that a larger percentage of patients with syph ilis visit physicians and dispensaries than do those with gonor

rhea. Thus the figures upon the number of cases of syphilis should come nearer the true state of affairs. From the above



Fig. 128.—Infection of the innocent. These circles represent a total of 8000 clinic cases of venereal diseases. At the time of infection, 70 per cent of the men infected were single and 30 per cent were married, whereas among the women the proportions were almost exactly reversed. The large percentage of women married at the time of infection suggests that the wife is not infrequently infected by her husband. (U. S. P. H. S. Washington, D. C.)

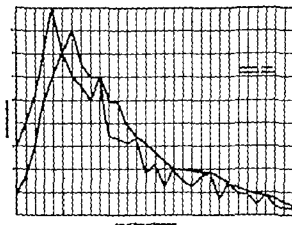


Fig. 129.—Infection of the ignorant. This diagram, based on 8000 clinic cases of venereal disease, indicates the proportion of cases acquired at various ages. Among women, the largest number were infected at the age of nineteen; among men, at the age of twenty-one. Many infections are acquired by boys and girls altogether ignorant of the danger involved. (U. S. P. H. S. Washington, D. C.)

surveys it was conservatively estimated that there were 518,000 new cases of syphilis treated by recognized medical agencies per year. This, of course, is only a fraction of the syphilis in the

country, but it is that part which allows of little discounting If we want to limit ourselves in our figures on gonorrhea to those who would be in medical hands if an equal percentage of gonorrheal patients did seek physicians, we might look to the Navy for a figure by which we should multiply the number of syphilis cases to find a justifiable minimum figure for gonorrhea. The incidence of gonorrhea for the three last reported years in the Naval Service was 3.54 times that of syphilis Figured in this way there would be under medical treatment 1,833 720 cases of

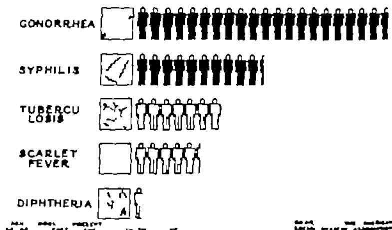


Fig 130

gonorrhea. Beyond this would be countless cases that escape every survey

Be all of these estimates as they may, it is obvious that there are millions of cases of gonorrhea every year that either are or should be under strict medical care Perhaps we cannot find too much for pride in the thought that about two thirds of them at least seek mercies other than our own Nor should we marvel that, under existing conditions, no matter how carefully we treat and control those we see we are not likely to banish this infection. That great unknown reservoir of infection stands as our seemingly insurmountable barrier to signal success. Though we

may consider as our great and direct responsibility those patients who do seek our direct help we never should blind ourselves to the fact that, as the guardians of the public health we owe much of education to those who do not seek us and much of correction for those who do what they can to keep gonorrheal patients away from proper medical attention.

LIX. THE ATTITUDE

No matter how one approaches the question of gonorrhea control he is sure to find the physician standing at the crossroads. He may spend his time in public education upon the facts of gonorrhea he may go out into the field and make a great stir among those who have the disease he may rave at authorities who do nothing about the prostitute who so commonly spreads the disease he may follow any avenue that even remotely concerns the problem, but always these eventually must lead to that pivotal point, the medical care of the infected The health authority knows this, the police know it, the social hygienist is aware of it, the prostitute knows it the sociologist sees it and raves in fact, everyone seems to know it except the physician himself Largely he lacks the social vision to realize that he is the center of attention from these and other groups an attention that does not always reach to the heights of hero worship

It has been the writer's privilege throughout a number of years to come into close contact with almost countless numbers of high-minded and sincere-purposed individuals who, because of a social vision that encompassed all humanity rather than a few restricted groups of it, were devoting their energies toward the protection of those of our fellow men who so often have not the knowledge the power nor the will to protect themselves.

Throughout these contacts so far as the physician is concerned there was apparent the utmost respect upon their parts for him as a scientist and doer of good. Few indeed have been the disparaging remarks about him but upon literally hundreds of occasions there have been such remarks as "The physician is a fine fellow but is thinking so much of his patients that he rarely sees beyond them" "I like doctors but I do wish they would awaken to more of their responsibilities to society" "If we only could get the interest of the medical profession in what syphilis and gonorrhea mean to those with whom their patients

may come in contact, we could make wonderful progress in their reduction.'

Of a certainty, there must be some fire where there are such large volumes of rather tolerantly emitted smoke. Often one gets the feeling that, if those kindly, tolerant individuals who direct the activities of many of these social moves were to voice *frankly what really is in heart and mind, the smoke would* be far more dense and by no means so pleasantly scented. And while all of this fire smoulders the physician most commonly follows his narrow path, healing and ministering to the bodily and mentally afflicted, spreading kindness and charity totally unmindful of those fields beyond wherein he has an equal responsibility and where thousands are craving his interest and aid and are anxious to join him in the battle. Never has there been a greater need that we "see ourselves as others see us' and then do something about the matter

Aside from the question of an interest in these matters of overwhelming social importance and of equal importance to us as physicians there is also as great a need that we analyze our attitude toward one another so far as gonorrhea is concerned It has much in it that is foolish shortsighted often unkind and certainly, not to the best interests of medicine or to the patients unfortunate enough to contract this disease. Most of it is of the nature of a misguided protective mechanism. It was born in an age of Victorian prudishness when the word gonorrhea was obscene to even semicultured ears and the term "venereal diseases engendered deep disgust—when gonorrhea was a punishment for so-called "sin." As social intelligence increased it lingered with us to kill interest and obliterate medical incentive. It is archaic, silly hurtful and largely American. It has been abandoned in England where it had the greatest right to live longest, and it largely is lacking in all of the European and Latin-speaking nations. In America, physicians boast with pride and commonly untruthfully that they never treat this disease. They often go so far as to say that they know little or nothing about it, which often is truthful Though the disease afflicts millions of their fellow citizens, it and the problems it presents often get none of their fancy and little of their interest.

The results of such an attitude in him who, by the nature of things, stands at the crossroads as adviser, ministrator and should-be-guardian are far wider than mere words can recount. They retard, obstruct and, far too often, they kill.

To correct faults we must realize fully that we have them and that we have them no one knows better than he who has dared to write a book on gonorrhea. In a lesser sense, the same applies to him who has written a book on that former equally taboo subject, syphilis. Most of them frankly admit that economically, it was their greatest mistake. The writer heartily agrees with them. Such men meet with many experiences that rarely present themselves to other members of our profession—experiences that often are tall timber and not the straws that tell how the wind is blowing. Many of these occurrences would make highly interesting reading and, to illustrate for purposes of further discussion, the writer cannot resist the temptation to recite a few of his own. In doing so he will abandon his usual custom of referring to himself in the third person and drift over to the personal pronoun.

Perhaps twenty years ago when I wrote my first paper on gonorrhea no less a personage than my friend the late Dr Hobart Amory Hare came to me with the following warning 'Pelouze, you are making a grave mistake in letting yourself become known as one interested in gonorrhea it will ruin you" My response was "Do you mean that a doctor who shows an interest in a disease that afflicts millions of human beings and has been so badly neglected by our profession that our lack of knowledge upon it is our greatest medical blot will be ruined? He replied, 'Most assuredly" To this I answered, Don t you think, then that it is about time a few of us were ruined? I am going to see what I can do to clear up the deplorable situation ruin or no ruin. Within a month three of Dr Hare s close friends gave me the same warning and let no one think that they were idle warnings. They were kindly acts that showed wide observation and a desire to protect. During the succeeding years many admonitions of a similar nature have been given by kindly older men.

Upon countless occasions and in many different cities I have

been told by those of high standing that they never treated gonorrhea and knew nothing about it. Many of them forgot the remark and referred me cases that they were treating at the time. It usually developed that the treatment applied showed that they were far more truthful when they said that they knew nothing about it. One of the number went even further in his own conviction he wrote a book in which he advised a treatment for gonorrhea that would wreck the urethra of any patient to whom it was applied. We have a standing agreement that if or when he gets the disease I am to have the opportunity of trying the treatment he advised upon him. Just about one treatment would place him among the delinquents.

A patient from Texas visited an urologist who had even stooped to write a book on gonorrhea, and told him that he also had been advised to see me. According to the patient—a cultured gentleman who seemingly knew truth when it was around—the urologist's answer was "You don't want to see him, he is only a clap doctor."

An urologist in my own city called me on the telephone to ask what he could do for a wealthy patient with gonorrheal arthritis. He prefaced his query with the statement, I would like to have you see him with me but if I did, the cat would be out of the bag and they would all know he had gonorrhea. He is much too important a man to be exposed."

Many more experiences could be cited were there the need for doing so. From the few recounted it is a simple matter to understand what has been, and is, going on within our ranks as the result of that old defensive mechanism that should have been abandoned long ago To me they have been matters of amusement, never have they caused hurt feelings or discouragement. They are not presented here in any sense of unkind criticism I have none to make of a profession that has treated me so kindly and courteously I know wherefrom they spring and I know equally well that there probably is not a physician in the entire country who thinks that one could survive upon the treatment of gonorrhea alone My deep concern is with what this common attitude does to the younger man of the profession but of this, more later

What about that term "venereology" and its effect upon the future outlook? In England and on the continent the appellation of Venereologist has attained a degree of respectability that does not frighten men away from it. In America the reverse is and probably will continue to be the case And there is every reason why it is a misnomer as applied. Probably no physician here limits his work solely to the treatment of these diseases Among many other things, they treat gonorrhea and syphilis.

It will be of interest to consider where this title started in this country and why But a few short years ago we heard nothing of it and, even today, it rarely is used by others than the urologists Even with them, it is a decidedly recent innovation and one that should be discontinued promptly if they do not wish to build up an aura that will lead to ridicule and do much harm

Ten or twelve years ago, because of the entrance into urologic fields of a number of the younger physicians who lacked either the desire or opportunity to do surgery the question was raised among those who guided the destinies of the American Urological Association, about the wisdom of dividing their specialty into two divisions viz., Surgical Urology and Medical Urology After much discussion over a period of several years the matter seemingly was laid at rest without any action having been taken. And no more was heard of the medical urologist as being entitled to a separate designation.

Then came the American Board of Urology, whose purpose it was to pass upon the fitness of those specially interested in any portion of urology to call themselves "Specialists" and to issue to the accepted ones certificates to that effect. Almost immediately after the formation of this board the word "venereologist' appeared in their proceedings and in their correspondence. Just why this was is not at all apparent that it is a move in an unfortunate direction is obvious to anyone conversant with conditions as they exist today There is a definite need for a division of the specialty into Medical and Surgical Urology, but there is neither need nor justice in applying to physicians in this country a title that carries with it both professional and lay stigma as does that of "Venereologist

Just where does all of this lead? It has many influences

none of which are to the best interests of Medicine or to those patients who rely upon it for protection and escape from diseases of the urogenital system. In all reason, Medical Urology should be a place of long apprenticeship before one aspires to the surgical aspects of the specialty It should be the foundation upon which urologic surgery is based. It should not even be an inferior grade of specialism. To pose it as such causes men to hurry through it to the Elysian fields beyond Long before they have served even a meager apprenticeship they must "leap to the heights that were made to climb." Were the Board of Urology to make a careful survey of just what is going on at present to secure the much desired "Certificate of Specialism" they would find ample reason to wonder if much has not been lost in the struggle for the greater gain. Perhaps they would be forced to the conclusion that it might be well to require that one prove fitness to be certificated as a Medical Urologist first and reserve the larger plum for future consideration unless the applicant obviously has had a wide experience in both fields. Perhaps in no other way could there be erased more quickly much that is a trifle inglorious.

It is not well to lose sight of the fact that for every patient in need of surgery *there are many hundreds who need something* else just as badly Glossing over or hurrying through those things that minister to the needs of the many that one more quickly may grasp the greater economic rewards accruing from the urologic surgery that applies to the few is none too kind to the many There is neither dignity nor safety in many of the present struggles to operate upon the 50 patients required by the Board of Urology It is producing an increasing number of things to outlive Also it is adding to human morbidity and mortality

It is not even to be suspected that this 50-case idea was born with the Board of Urology It was inherited by them having so far as the writer knows come into prominence in the requirements for membership in the American College of Surgeons. Properly supervised, it is a wise thing and deserves to be continued. But it is not supervised and the requirement has become an obsession with many neophytes in urology—so great

an obsession that many men pathetically equipped to do so have joined the race for the half-century mark. As "in all things evil there is a soul of good," so in many things good there is a soul of evil. And whatever there is of evil most certainly cannot be attributed to the present Board of Urology For there is not in all the world a group of fairer or more conscientious men than its present personnel

The treatment of gonorrhea always has been considered to belong in the special domain of urology It is to the urologist that the general practitioner, who by the nature of things, must care for this disease also, looks for information, guidance and help It is primarily ours to discontinue the foolish things that have done so much to retard science and to cast discredit upon the treatment of this widespread and serious human disease

LX. THE DISPENSARY

In the parlance of the day the gonorrhea dispensary is "our baby," and one who visits many dispensaries wherein gonorrhea is treated will not travel far before he is forced to admit that we have a large number of very poorly cared-for 'babies." In searching for the reasons for this unfortunate state of affairs his journey will lead him in many directions, and he will find things that depress him no matter which angle of the subject he studies. Far too often he will find himself harking back to that previously discussed problem of attitude. For it is beyond question that much that is not as it should be in the dispensary situation is due to the fact that attitude has neither given men courage nor pride, so far as the treatment of gonorrhea in the unable-to-pay of dispensary practice is concerned.

As one talks with the general practitioner he will hear much of that thing called "dispensary abuse," but he will spend much time in dispensaries for the treatment of this disease without finding any great evidence of such abuse of the privilege on the patient's part. He occasionally may be led to suspect that the abuse is far more often on the other side of the house. There can be no question regarding the fact that many patients seek free treatment in dispensaries who can and by all right, should go to the private office of a physician. But it can be stated without fear of successful contradiction that this does not apply in gonorrhea dispensaries. In his many years of dispensary experience the writer has encountered so few such cases that they merit no consideration whatever from this standpoint. In fact all but a very few patients who could pay a private physician had been sent to the dispensary by one. Men when they have gonorrhea and are able to pay even a fair fee for its treatment, do not go to dispensaries. They either go to the charlatan, the druggist or the physician. Most of the poor go to the druggist first and those countless ones whose disease fares badly then visit a dispensary In other fields of urologic dispensary practice there is much dispensary abuse.

From such a state of affairs, it is obvious that there is the most urgent need for dispensaries for the treatment of this disease and, in all sense of fairness to those who must attend them, they should be well conducted ones wherein good work is done. In equal fairness to those who do the work, it can be said that there has been a definite improvement in many of them during the last decade. That conditions are far from being what one *could call "acceptable" has been shown by several recent surveys.*

Let us consider, for a moment, the result of one made by Wishengrad and Goldberg[1] of 53 clinics in Greater New York within the last year In evaluating the results of this report it should be borne in mind that the New York City Department of Health has been carrying on an intensive campaign against gonorrhea for several years and that probably nowhere in the country has more effort been exercised toward dispensary improvement. Owing to the fact that some dispensaries had services on alternate days attended by different physicians with each group pursuing its own methods, it was the opinion of these investigators that the survey could be considered as one covering 67 dispensaries.

According to them the Sanitary Code of the New York City Department of Health says that Dispensaries shall be open at least three days a week. They found 7 operating two days and 1 operating only one day a week. Eight clinics were free. In others, the fees ranged from 50 cents to 2 dollars per treatment. In the majority it was the former As a rule, there was an extra charge for laboratory work. Where smears were examined by the dispensary physician, methylene blue was used alone and there was no extra charge made. Very few pay clinics even where the fees were low were overcrowded. All but one free clinic were grossly overcrowded. There was practically no follow-up service in any but two The number of delinquencies varied from 50 to 100 per cent of the patients. Physical examinations were not made, and even local examination of the genitalia was not made in some Case records largely were meager and highly uninformative Smears for diagnosis were not done in 6 of the 67 services There was little or no provision for

[1] J Soc. Hygiene 24: 26, 1938

privacy in 29 of the 43 dispensaries, histories being taken and treatment carried out with groups of patients present. Often where there were provisions for privacy they were not utilized. Twenty-nine services employed only oral treatment with such things as urotropin, oil of sandalwood and Lafayette's mixture

As compared with conditions in most large cities, this is not such a bad record as it would seem to be. Compared with what it should be, it is decidedly depressing. There are those who insist that there can be no valid excuse for medical neglect. For which reason we would do best to search out the causes and see what can be done about them. And we shall find that most of them center around the previously discussed subject of attitude, which, in this case, cannot be laid at the door of the physician alone.

In New York this rather distressing set of dispensary conditions is being greatly improved In most other cities, where conditions are far worse, there is nothing being done about the matter mostly because no one seems to care. It is no stretching or perversion of the truth to say that, where there is one properly run dispensary for the treatment of gonorrhea there are dozens of another type with all of the faults and few of the virtues found by Wishengrad and Goldberg in the above city Such laxity places us in a decidedly vulnerable position at a time when we may be fighting to save both the science and the art of the practice of medicine from those misguided souls who have looked so intently at motes in our eyes that they cannot see a world of good in our hearts and the deeds that spring from them.

No one even slightly conversant with present extramedical trends could see either wisdom or safety in the continuance of a dispensary set-up that offers such opportunities for criticism Our politicians sob over the medical neglect of the poor and our "inability or unwillingness to care for them They search our doings for things with which to bolster their arguments. One who too freely spends public moneys must have many herrings to drag across the trail of public discontent He must give those who have votes other things about which to be angry and vocal. Today our profession is one of the many herrings and we would do well to look to any shortcomings we may have and take steps toward their correction. And nothing cries more loudly for at

tention than does the dispensary in which the poor must seek treatment for this disease. We must not think others are as blind as we ourselves have been in this regard. One of the first changes *toward present medical conditions in England was to declare* syphilis and gonorrhea such public menaces as to be affairs of the State—as things to be viewed apart from most other diseases.

Beyond doubt there is every reason why we should look mat ters squarely in the face admit that here is our worst present neglect, analyze the conditions that make it so and immediately do something about it before others do it for us It will brook us nothing to make excuses, all the rest of the world is doing that.

The subject cannot be solved by saying as commonly is said 'That our dispensaries are exactly what those in charge of them let them be.' More often than not, those in charge have little real control over the situation It, of course is probable that properly imbued they could make their dispensaries far better than they now are, but there are, even then many things that must be overcome before much pride can be taken in the im provement. Our search must go far beyond the poor chiefs of dispensaries In fact, it must reach into those things that moti vate or fail to motivate human endeavor No matter to what ideals we may soar we must not forget one thing viz., doctors are human beings first and idealists by culture. Idealism can be nourished in ideal surroundings and usually it can be made a decidedly sickly thing or entirely killed by adverse influences and environment He who remains an idealist in a dispensary for the treatment of gonorrhea is certainly not one of the least of God's creatures. Some of them do, but many do not whole heartedly and perpetually subscribe to the idea that "work well done is its own reward" For which reason we might do well in the present analysis to lay aside the questions of active and latent idealism and consider human beings and their common reactions

It is outstanding that there are those human beings who cannot do certain things well others who will not and some who do not want to. To these we might add the trite observation that an enormous percentage of humans do not take much pride in the doing of unpleasant things unless *there is some encouragement*

or reward for their doing. And we can go further by saying that, unless one is imbued to the point of overflowing with the love of doing good for the most lowly, he finds neither poetry nor reward in this generally thankless task. Unfortunately, this is not an age in which men are satisfied very long with nothing but spiritual rewards. Necessity, or desire for success, demands more material things.

The world has changed and medicine has changed with it. A spirit of haste has gripped our younger men who "Scorn to wait for the thing worth having they want high noon at the day's dim dawn." The old days when men in medicine expected and were willing to serve long apprenticeships to reach high places are gone. And the most optimistic worker in these dispensaries could not possibly imagine how such work could hasten "high noon for him. So far as it leads to professional advancement it is a cul-de-sac, there is no nether opening Nor is there a star to which one can hitch his wagon for if he shows too much interest in gonorrhea and talks loudly about it, there is more than an even chance that his road beyond will lead him downward rather than to the heights he dreamed of reaching It has done so to others and at the hands of their medical confrères. So why rave at men who so easily can become the vic tims of such unwanted things? Far better to devote the energy toward the correction of the evil influences that make things as they are.

Society as the result of the recent campaign of lay education is emerging from its long sleep and laying aside its foolish condemnation of those who have gonorrhea. Indeed it is moving in this direction faster than are a large percentage of our medical brothers. In its awakening it is removing the only reason why doctors claimed with pride that they "never treated venereal dis eases." And that same society that but two years ago looked upon these diseases as loathsome punishment for sin, is rising to such heights of intelligence regarding the true state of affairs that it will not think with pride of the medical man who holds himself as too nice to treat any disease that afflicts even the most evil of human beings. The time is upon us when he who makes such boasts will only succeed in belittling himself

What of the attitude of the hospitals wherein most gonorrhea dispensaries are placed? By and large, it is at a decidedly low ebb In many hospitals such dispensaries are just about tolerated as a necessary evil. Those in authority take no pride in the work done and little in those who do it. More often than not, such dispensaries are given quarters that no one else will use and almost everything in the way of equipment is begrudged them They call them "venereal disease dispensaries" they deny them social service facilities and let them drift along as best they can.

What of those dispensaries in teaching institutions? Well, the writer has many friends among the professors to whose services they belong and, in order to hold them it might be wise to *stick to the general and avoid the particular* He has watched them for many years and has learned many things that some of them could ponder with profit. There are a number of reasons why young men turn to urology some commendable and some not so much so No matter which one serves as the motivating influence almost all of them have one thing in common they aspire to become urologic surgeons. For a short time they are willing to do what generally is considered the "chore work." Unless they can see some opportunity to rise above this lowly station, they follow in a short time one of three rather common trends If they are in a city where there are other teaching institutions, and have ambition and ability they move onward If they are men of meager ability and little incentive they stay for a while and then find something more pleasant to do or they linger on as individuals whom a cruel fate has used unkindly lose interest in the work and do it largely as a matter of habit After varying periods most of them see the futility of it all, become inconstant in their attendance and finally retire to lick their wounds. Some few beaten souls are so much in the rut that they live and die where they started. They unthinkingly poison the minds of those who come to help them and finally it becomes almost impossible to keep a large enough staff to do the work as it should be done

While all of this is transpiring the professor who has reached the top rung of the ladder he set to climb all too often views the dispensary as does the rest of the hospital. He has to have one,

the work has to be done, and he commonly seems to forget that it is an important part of the service for which he personally is responsible. So long as it causes him no trouble he lets it drift. He appoints some one as chief and tries to forget it. Lack of "floor workers" is the chief's worry When things reach such a low level that talk starts they go into conference place the blame everywhere but where it mostly belongs, and then they do mostly nothing about the matter They cannot take their clinical assistants too roundly to task for fear no one will be left to do the work that they would not think of doing themselves, even if they could fit it in with the day's work. Rarely do they see how simply things could be corrected. They pat the discouraged disinterested ones on the back and encourage them to bring more medical "lambs to the slaughter And all of this in the names of Science and the Humanities.

Things in this life are seldom as they could be they somehow seem to have the habit of being what environment and other things let or compel them to be It however often is the case that the application of a little tolerance a little kindness and a lot of the will to do can raise things above the mediocre and make them approach more nearly the ideal In this connection we are faced by millions of people throughout the land who have in one way or another contracted a disease that is a menace to both themselves and society Most of us know what the ideal dispensary worker should be and for those who do not, the American Neisserian Medical Society has put on record its idea of what one should be to care for the poorer of these victims. This opinion was arrived at from the answers of its membership to a questionnaire covering many other phases of the gonorrhea problem. In their 1936 Proceedings (p 53) will be found the following gems regarding the qualifications of our dispensary worker "He should have a sympathetic understanding of human behavior a correct understanding of one s responsibility to patient and society knowledge of what transpires in the tissues when infected by the gonococcus knowledge of what assists Nature in overcoming gonococcal infection ability to recognize when infection no longer exists access to and ability to use a microscope."

In a space on this part of the questionnaire left for personal remarks appeared the following evidently written by a man who had seen and heard some things "The physician must be a man who can recognize that the sufferer from gonorrhea is the same human being he was before he became infected—just unlucky He must be able to extend the same courtesy as to an asthmatic or a 'dyspeptic.' He must have some resources of knowledge beyond taking a smear' and sending it to a laboratory and passing out an argyrol prescription He must know better than to promise a three weeks' cure try to produce a different bag of tricks at each visit and in desperation at the end of three weeks time, ram home an over-sized sound. In other words, he should not be one who relies on a hazy remembrance of medical school lectures passes over every article or book on this disease as beneath his notice, and sneaks in the gonorrhea patient by the back door in the endeavor to extract eight or ten dollars before the patient gets disgusted with his repertoire. The doctor treating gonorrhea should be as well equipped with knowledge and appliances as one treating iritis or placenta praevia."

Here we have the standards by which dispensary workers should be measured from the many and from one who seems to know more about existing conditions than many of the many probably do Beyond question both are correct. We need many more hundred specimens of our ideal than we now have, if we are to look with pride upon our future accomplishments. The questions that arise are Where are these Savonarolas Martin Luthers, and John Miltons in our ranks? And How can such men be gotten to join the system that largely holds to minister unto "the least of God s children and to keep on ministering until the 'grim reaper" carries them to a well-earned rest at the "Great Right Hand"? He who solves these riddles should live long in content ment in the knowledge of a thing well done He will get no Nobel Prize though he has done mankind a service that merits it. But more of this in the next chapter

LXI. SOLUTION

SURELY the foregoing is a dull, drab picture of an extremely important field of human endeavor He who even suspects that it is in any way overdrawn has only to question some of the greater of our brother urologists and to visit a few dispensaries, to inquire into personnel attitude and mentally to put himself in the place of the patient who must rely on these tender mercies Would that thousands would do so In no surer way could the needed corrections be forced.

It brooks us nothing to revile those in whose keeping such things are. For behind it all are so many sins of general omis sion that one justly might ask, "Who is he to cast the first stone?" Far better to admit the blemish develop the desire and the will to do something about the matter and then get busy in a kindly way There is no need for rabid reformers who make a great noise and accomplish mostly nothing The first real need is for kindly, intelligent study of the influences that brought these things about and the development of kindly ways to correct them.

Perhaps our first move should be toward better public edu cation upon the ways of gonorrhea and what is needed to combat it. As one takes the larger view of the problem he will find that professional attitude is but a reflection of social attitude and that it is from defective attitude that most of the evils have developed as previously has been said. Much already has been done to remove the element of lay taboo from the discussion of both gonorrhea and its companion disease, syphilis and to make highly ridiculous the longer continuation of a state of medical mind that never did have real justification. There is no physician who could not and should not aid in such lay education if for no other reason than to remove from the shoulders of medicine what is perhaps its greatest blemish of the day

Not only should we remove initial causes by lay education but we should look carefully into our own minds and erase the old fixations that are unworthy reflections of them. To do so would be to remove much that has served to make even interested

men hesitate to follow an urge to help in the battle. Much has been said about the inhibiting effect of these things upon the younger medical mind in the preceding chapters and little elaboration is needed here. Few of us realize what a vast influence such things have had in making it almost impossible to get the more intelligent type of young physician to aid in this battle. Even the more callous and less intelligent frequently refuse to take part, no matter how much they may desire clinical experience or a hospital appointment That it goes much further than this is known to all of those who have tried to obtain the interest and support of more mature men in a campaign for disease control. Even the urologists into whose field this disease unquestionably falls will not aid to any great extent for fear their professional brothers might look at them with disdain. Indeed, they usually are the ones who are most lacking in the courage to fight openly the battle that is theirs.

Having seen the light ourselves we might do some kind of an operation upon the intellects of those who sit in high places on hospital Boards of Managers. They have much to correct and usually are in a position to do it. We even might give some attention to the mental workings of the hospital superintendents and, with perhaps more adroitness, we even might dare to hypnotize a few superintendents of nurses to the point of overcoming the far too common sneer when the "genito-urinary dispensary" is mentioned.

When these things have been done or started, we might put on a more impenetrable type of armor and beard in their dens those elect of all God s chosen the professors of urology who still fail to realize their moral responsibility to and for those obscure medical creatures who often do a more glorious work in their dispensaries Perhaps we might make them see that good talent does not remain in a scientific cul-de-sac that when they criticize the type of help they get and keep they are casting slurs at themselves and a system for which they alone are responsible. It should not be difficult for them to understand that workers of the type they want have ambitions that soar far higher than a life of such work and that they will not stay long where all opportunity to reach the haven of their dreams is denied them

There are men in high places with vision enough to see that just so soon as men are put in low places and ever after kept there department standards deteriorate. Many of them have acted upon this realization by not doing such things They have stimulated and fostered ambition among the younger men by the means of rotating services. They have gloried in men growing big beside them and have left in low places only those who lacked the ability or desire to rise. This is as it should be, and as it must be if a high standard is to be set and maintained for those younger men who enter their specialty Merit, no matter where it be deserves a just reward. And no one will deny that an urologic dispensary in a teaching institution is mostly what those responsible for it allow it to be.

And when all of these things are said and done, there is another that stands out like the proverbial "sore thumb We may call it a sad commentary upon Christian spirit, sordid or what we will, but it is there and we must face it. Many cannot —and most young men will not—put in the long hours that such unpoetic work requires without some economic compensation. And, no matter how much we labor to instill into others the spiritual reward of work well done we cannot and will not solve the problem unless a way is found to give financial compensation. Economic necessity is a stern master and a sworn foe to beautiful ideals.

One easily can imagine the consternation of many governing boards of hospitals at the suggestion of such a thing. Leading lives of struggle against usually mounting deficits they at first, would see nothing but ruin in such a system Immediately they would say "If we start it in the gonorrhea dispensary a precedent will be established that will cause every dispensary worker to rebel unless paid a like sum. As a matter of fact, such a rebellion immediately could be quelled by telling the rebels they could work in the gonorrhea dispensary for the same salary No mad rush to do so need be feared Taking all of the circumstances into consideration it is outstanding that we must view our dispensaries where both gonorrhea and syphilis are treated as being in a class by themselves and not always to be planned for in the way that applies to other branches of medicine

Idealism notwithstanding, it is a decidedly general trait to do those things best for which one gets paid and it is almost as general to resent orders given by those who take no part in the paying Almost every chief of a gonorrhea dispensary knows these things, and he knows that he usually is limited in accomplishment just because what authority he seems to have is no authority Even the Government knows it and shows it by the freedom with which it takes busy men, gives them a salary of one dollar a year and some sort of title, and orders them to places at its will and convenience True, it pays the carfare and it also gives them a daily subsistence fee when on government duty Despite the fact that the latter fee often pays only for the room in which they sleep at night, they gladly give in full measure of their time and knowledge

It has become the custom throughout almost the entire country to charge dispensary patients a small fee for each treatment. And if even these fees were divided among the younger men who work in gonorrhea dispensaries many of the dispensary evils quickly would cease to be. These young men do not ask for unreasonable compensation. They are willing to meet the situation more than half way They know that dispensary service costs the hospital far more than the aggregate of the fees collected They also know that against this service are charged rent and such things laboratory costs and the costs of supplies Mostly they do their own laboratory work and the supplies required in such dispensaries are so few as to weigh lightly in the general hospital expenditures. Often, they feel that the quarters furnished to them would be expensive at more than a dollar a month even with heat light and water added

Unquestionably there are many other angles to the matter of solution, but if just these few were attended to in a proper and kindly way there soon would be few things left in the dispensary picture about which one would be tempted to say "hush" And there is no need that our problems be laid in the hands of an unusually paternalistic government with pleading cries for help for truly this is our baby "

LXII. THE DRUGGIST

WITH all of the things that all of the critics can say about medicine as it is practiced today they could not possibly tear it down to the level to which an overwhelming percentage of our retail druggists have allowed themselves to drift. There was a time, well within the memory of a large percentage of us when pharmacy was a science that had to do with the compounding of prescriptions. The one who held a degree was a proud member of rather a highly dignified profession He knew something about drug action, much about safe dosage, considerable about the compatibility and incompatibility of drugs and, as was right, he knew the antidotes for the more common poisons He was an expert at the making of extracts fluid extracts, tinctures, syrups and all the rest of those things that appeared in the Pharmacopoeia and the National Formulary and he made them well. He knew little or nothing about those physical disabilities for which his wares were prescribed and he knew that he knew nothing To his pride and honor he was the real friend of the physicians in his community and he was admired and trusted by them.

Into this state of things as they should be something sinister crept so slowly and gradually that, long before its full import even dimly was sensed, it had grown to great proportions. Of course, some of it always had been with us, for in every large group of human beings there are sure to be some whose ethics drift to the lower levels and because of a familiarity with the things that are used for bodily ailments, they try to build up an aura of great knowledge of the ailments themselves. They become superscientists and as the ego increases it crowds so much upon those cerebral regions that have to do with pride in the right that these centers undergo a gradual atrophy That beautiful something that we call "ethics," that thing born of conscience honor and the innate or inculcated sense of right doing, eventually grows to be an extremely anemic attribute Eventually human ailments become things to be exploited, often ruthlessly for economic gain.

We knew the day when these individuals were so rare among druggists that they caused us little concern. They lost our respect and we kept our patients and ourselves away from them We, and even the high-minded members of their own profession, largely ignored them and their methods. Until it had happened we failed to see the changes they were making in the minds of the uninformed or unthinking people who patronized them. Gradually they seemingly were crowding the more ethical members of their fellows into moves in self-defense. They were creating the impression that, with all their superior knowledge, one need only come to them for relief of the common illnesses that it was needless to consult a physician except for those of a more serious nature In short, they were practicing medicine.

Always there have been people who seemingly liked to be *taken advantage of people who believed all they were told of* the wonderful medicinal values dwelling in some generally useless concoction. The medicine venders knew all about these people centuries before Barnum made his discovery Vast fortunes had been built upon this human credulity Thus, these largely conscienceless members of a then dignified profession started upon a campaign with the stage serenely set for financial gain Those who were not too blatant prospered in a material sense and, as they prospered, widened their circle of public "education." Others, either in self-defense or for less commendable reasons followed their example until, today, the practice has increased to such enormous proportions, and has infiltrated this formerly proud and dignified profession so thoroughly as to reverse the old percentages and to make the druggist who does not do counter prescribing far more rare than were the unethical *ones in days gone by*

Alarmed at such a situation the legislatures of most if not all of our states passed stringent laws against the practice many of them carrying prison sentences upon conviction Many termed it the illegal practice of medicine," which, in reality it is At first these laws instilled a slight sense of caution into those given to the practice but today no one pays any attention to the matter Druggists prescribe for almost anything and everything and few indeed are the physicians who have not had to repair upon many

occasions the damage so commonly done. Of a certainty there is no branch of science that has gone further toward discrediting itself than has this. Yet, to their everlasting glory, there still are some druggists who refuse to sink to the rather general level.

As the result of this and other things, most drug stores have become variety shops and restaurants and the medical profession largely has lost confidence in them the druggists in turn resent the medical attitude and the old feeling of mutual admiration and respect grows rarer day by day Countless physicians, to protect their patients and themselves dispense their own medicines and many druggists revile them for doing, particularly in the smaller communities, exactly what they forced them to do

A few years ago in order to reduce the terrific mortality from appendicitis, there was a widespread campaign waged against the giving of purgatives to people for abdominal pain. In this campaign it was shown that the druggists were the worst offenders. Druggists were given placards for display to the public regarding the great dangers of such medication and, largely, they put them in prominent places in their stores. But, as far as the writer knows, little was said and nothing was done about the proved fact that countless druggists had been practicing medicine Seemingly this is a matter of size, numbers and capital invested for the little illegal practitioner of medicine, most assuredly has not fared so well. He has been hounded from pillar to post, often he has been given a vacation in some penal institution. And, largely the medical profession has been the accuser that made his troubles so many While this has been transpiring the prescribing druggist has continued unmolested. What big bad wolves we are! We hound the little offender as protectors of the people and there we stop

But enough of the general. Let us narrow ourselves down to prevailing conditions that have to do more particularly with the question of gonorrhea. Here we are not dealing with a stomach ache a headache or a cold. We are dealing with a serious contagious disease that everyone admits is one of the greatest of social dangers. We are dealing with a condition that maims and blinds and kills, that lurks in its victims long after the symptoms disappear and that can be transmitted to others as long

as a single gonococcus is present. Surely, no one with as much knowledge of its dangers and as little of its proper care as the druggist has would ever dare to assume the responsibility of treating it, no matter how insistent the patient may be or however much he might need money Well, as a certain gentleman repeatedly said, "Let's look at the record." And in this event, thanks to many surveys made in all parts of the country by the American Social Hygiene Association and the United States

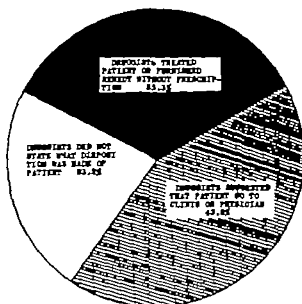


Fig 131—Drug stores in relation to venereal diseases in Philadelphia Disposition made by 237 druggists of 2355 alleged venereal disease patients who applied to them for advice, remedies or treatment during January 1929

Public Health Service we have a record that makes what previously has been said sound *like the prattling of little children*.

We might start our "looking at the record in the country's greatest medical center Philadelphia. In 1929 there was made with honesty and conscience a "Hospital and Health Survey" The date is not important, for every doctor in that city knows the druggists were only shocked not converted by its revelations and that things are the same in 1938 Of course the druggists called names and despite the fact the questionnaires some of them answered were in extremely simple English they even said that they did not know what it was all about and made errors

in their figures because of this lack of knowledge. The result of this survey is shown in Fig. 131 and leaves little room for argument, though it does raise a question as to why 23.2 per cent of the 237 answering the questionnaire failed to reply to the simple question of whether or not they treated these diseases.

Assuredly this particular survey needs no further comment beyond the fact that, being one of the earlier ones, both of the organizations that conducted it learned much from it to guide them in the many later surveys. Among other things they learned that those who confess on paper often recant the confession. In the later surveys investigators posing as having a so-called venereal disease, obtained the information directly from the druggist without annoying him with questionnaires, the results of which are so easy to discredit. Parenthetically it can be said that, wherever the two methods of survey have been employed, those of direct investigation always showed that a far greater percentage of druggists did treat these diseases than the questionnaires would lead one to believe. The results of a number of these later studies are to be seen in Fig. 132 and from them can be obtained a trustworthy understanding of conditions throughout the country It comforts the writer that all of the evils are not confined to the City of Brotherly Love One city Washington, D C., even gives some attention to the matter

The question that naturally arises is, Why do conditions in Washington, D C., differ so widely from those conditions holding in most of our other large cities? It would be pleasant if the answer were that the druggists in the Nation s Capital are such a high-minded group that they refuse to stoop to such things. Such an ideal explanation, however does not give us the real answer There are only two reasons why things differ there and they are not altogether idealistic ones They are simply law and law enforcement. In 1925 Congress passed "An Act for the Prevention of Venereal Diseases in the District of Columbia, and for Other Purposes." For our present consideration two sections of this Act are important. These are as follows

"Sec. 11 That it shall be unlawful for any person, firm or corporation to advertise within the District of Columbia any medicine or remedy by means of a prescription or otherwise for the

treatment, cure or prevention of syphilis, gonorrhea or chancroid Provided, this section shall not apply to advertising of drugs in medical trade periodicals or scientific, medical or dental journals, or literature mailed direct to physicians, dentists, hospitals or for those engaged in the sale of drugs and medical appliances."

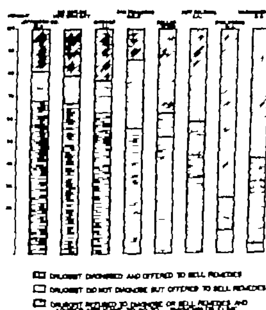


Fig. 131

"Sec. 12 That it shall be unlawful for any person firm or corporation to sell any drug or medicine to any person other than a dealer druggist hospital or physician for the cure or allevia tion of syphilis gonorrhea or chancroid without a written order or prescription written for the person for whom the drugs or medicine are to be delivered and signed by a physician authorized to practice medicine in the District of Columbia"

According to Fig. 132 there still are some druggists who disobey the law but the number is so small compared with the offenders in other cities as to demonstrate the value of the law where efforts are made to enforce it. That every state should have such a law is beyond serious question, and every physician knows that its enforcement would pay enormous dividends in the control of these diseases.

It is true that many of our states have some laws against the treatment of these diseases by other than physicians. And it is just as true that little attention is paid to them. New York for instance, has a law of sufficient clearness to correct most of these evils and, yet, by referring again to Fig 132 we see that it has not done so. That it has not is to be attributed solely to lack of enforcement, for surely, the following excerpt from it shows it sufficiently specific for the purpose for which it was intended

"No person other than a physician shall treat or prescribe for a case of venereal disease or dispense a drug, medicine or remedy *for the treatment of such a disease, except on prescription* of a physician. Prescription shall be retained by the person dispensing such drug medicine or remedy No copy of prescription shall be made by or delivered to any person. Prescription shall be filled at once" (Article 17 B-Sec. 343 q of The Public Health Law of New York.)

In these days when so much is thought and said about the heavy burdens of the poor attention wisely could be given to this great addition to the burdens they must bear For it has been demonstrated repeatedly that the poorer the community the most surely does the neighboring druggist treat these diseases. This was shown in a previously cited survey made by Dr Paul R. Leberman upon *the prescribing of sulfanilamide for gonorrhea.* In the poorer communities upwards of 90 per cent of the druggists urged its purchase. The same was shown in two surveys of dispensary patients made at the writer's investigation. A large percentage of these, particularly among the Negro race, are treated for varying lengths of time by the druggist before they reach the dispensary

Considering that the drug store treatment of gonorrhea is done by those with scarcely any knowledge of the disease and who

neither make a real diagnosis, keep the patient under control nor make the least effort to carry out tests of cure, there is little wonder that gonorrhea ranks next in frequency of its incidence to the common cold Could there be a greater social menace?

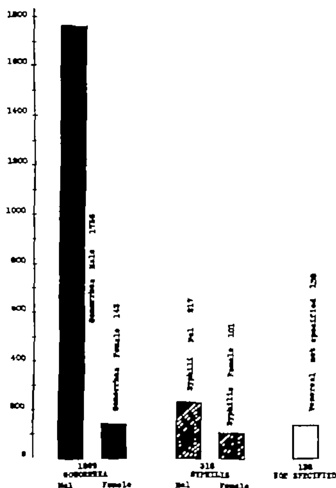


Fig. 133 —Drug stores in Philadelphia in relation to venereal diseases. Cases reported by druggists as applying to them for remedies, treatment or advice during January 1929

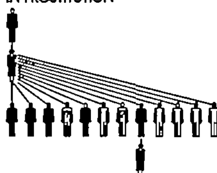
That many druggists deeply deplore the depths to which their high calling has been dragged and are doing what they can to return it to its proper place, is shown by the formation and activities of the Druggist s Guild So worthy a cause deserves all of the support the medical profession can give

The chief interest of the physician in prostitution is neither as a vocation, avocation nor as an art, but as a most potent means whereby genitoinfectious diseases are spread. Whether the prostitute is a social or police problem concerns him little from

HOW SYPHILIS SPREADS



IN PROSTITUTION



IN MARRIAGE

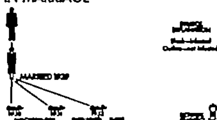


Fig. 134.—(From Survey Graphic Magazine, July 1936 Copyright, 1936, Survey Associates, Inc.)

a disease standpoint. True, his larger vision should encompass these things but there are other fields in which he can be of far more service Situated as he is he has unusual opportunity for telling educational efforts. *If he only combats some of the com-*

mon beliefs among his adult patients and the youths with whom he comes in contact, he will have done great service in disease reduction. For there are many erroneous beliefs among them

Perhaps the saying he hears most often is that "If one thinks he must have sexual intercourse he is far safer if he goes to a prostitute, as she knows how to take care of herself" No one knows where this belief started, but it is so generally made to and by young men that it has engendered in many of them a feeling of real safety Almost every physician has seen patients who harbored this faulty belief to their undoing The extent to which this idea gives a feeling of near-safety to mature men, frequently married ones, is beyond computation Almost every convention of size sends back its quota of surprised and highly repentant playboys who, because of their near-belief that "prostitutes know how to take care of themselves not only failed to be concerned about the possibility of infection, but returned home in their mental fool's paradise and infected their wives. Every doctor knows that, if for a period of five years every organization skipped its annual convention, thousands upon thousands of wives would escape such an infection. However, such a thing is not likely to happen for which reason we would do well to erase the idea of safety wherever and whenever we can.

Not so many years ago this sad conviction seemed to be shared by even a number of physicians The writer has treated not a few young men who had been given such a gem of knowledge (?) by a physician. And not all of these cases were in the dim distant past. Three have been within the last year It, of course, is possible that some prostitutes do know how to "take care of themselves" in a decidedly inefficient way but, even if they do many of them would be so busy with the taking care that they would starve to death—or have to go on relief" Those who still feel that they are doing yeoman community service by such a teaching might find something to their interest and surprise in a study of Fig. 135 Surely there is nothing to suggest "care or safety in the percentage of infections present in this group Further if one adds to these percentages the number of infections that were sure to escape detection in the routine studies of such individuals he will be forced to the conclusion

that the signposts of his deluded brothers should point most definitely and emphatically in other directions.

It is common practice among prostitutes to display a doctor's certificate stating that they are free from infection. Common sense alone tells us that no honorable, thinking physician would sign such a certificate. The same gift should reveal to the customer that even if she had no disease at the time the certificate was issued, which probably was not true she must have had many opportunities to acquire one in the meantime. And, yet

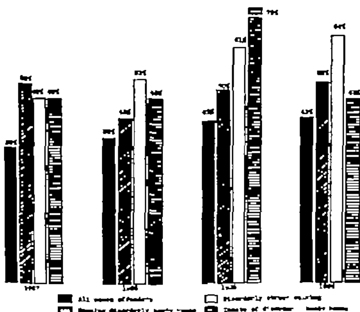


Fig. 115.—Venereal diseases among women offenders examined by the medical department of the Philadelphia Municipal Court, 1924–1927

there are doctors—of a sort—who add materially to the year's income by signing such papers.

Beyond question, such "medical inspection" is a scientific farce. Prostitutes know this as well as do their endorsers and they resort to all sorts of tactics to obtain a "certificate." They send others for them, they urinate and take a vaginal douche just before they visit the doctor and out in Seattle (according to Jones) they even take sulfanilamide for a few days prior to the "study." There are few practices to which a small number of

physicians resort that are more degrading more inefficient and more vicious.

Some few physicians still hold the idea that, by favoring prostitution with their traffic signals they are protecting the public from a pack of hunters who know no closed season If this thought ever did have justification it most surely has none today It has been shown in cities wherein prostitution has been almost abolished for a time that there is a decrease and not an increase in sex crimes, particularly rape. This cannot be explained by the belief that prostitution is not reduced greatly when all houses of prostitution are closed that the prostitutes are only driven into the more reputable portions of the city—scattered as it were. Such a belief is not greatly in accord with the known facts. Largely, prostitution is what might be called a highly organized business and when one city becomes unhealthy for the vice-barons, they move to another and they take their prostitutes with them. Those who stay behind usually have been raised in the community and have not been the inmates of such houses They always were with us and undoubtedly always will continue to be Many of them eke out an existence by serving as what are termed call or party girls" and it is to their tender mercies that most visitors to cities owe their infections. No one has found a way to eradicate clandestine prostitution or to keep it free from disease and they probably never will.

We have it in our power through patient education, to reduce greatly the number of infections from these sources and we would do much for society if we viewed the problems involved sanely and did what we could to reduce the numbers of those who make these hazardous journeys

The entire problem of prostitution is an extremely broad one that touches the medical profession in many ways. And we should do well to give careful attention to these points of contact as well as to some of their social aspects.

So potent a factor is prostitution in the spread of the so-called venereal diseases that here again we wisely could urge the passage and enforcement of laws such as the previously cited District of Columbia Act in Section 7 of which appears the following

"Sec. 7 That prostitutes and all persons convicted of any sexual crime, such as fornication adultery, and other offenses, and all procurers bawdyhouse keepers and similar persons shall be presumed to be a source of infection and shall be subjected to medical examination under the provisions of this Act."

LXIV THE PUBLIC

It has been the general experience in the control of contagious diseases that the first great need for progress was an informed public. Without such public enlightenment there can be hardly any worthwhile gain in disease reduction It was so of tuberculosis, smallpox, diphtheria, tetanus and all other such diseases It is so of cancer, and it is even more so of those two

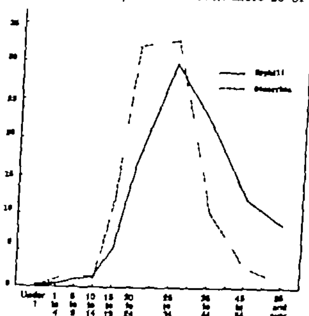


Fig 116—Age grouping of 73,654 reported cases, California, 1924–1929 (percentage distribution)

diseases that are so closely entwined with human desires, gonorrhea and syphilis. By no one can this education be more effectively carried out than by the physician himself And now that the old social taboos largely have been overcome there exists not a single worthwhile reason why he should not bestir himself toward this end It is not enough to confine his activities to that time when infection has been acquired He has by all odds as great a responsibility for disease prevention as he has for disease

treatment. In no human ailments is it more necessary that there be a safe general knowledge of the diseases themselves, how they are acquired what they do and their prognosis.

It is probable that comparatively few physicians realize the deep abyss of general ignorance that exists regarding these two diseases. No one can estimate the number of infections that are due to ignorance alone Predominantly a disease of early life,

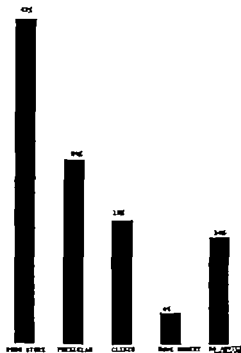


Fig. 137.—Where 100 young men advised going for venereal disease treatment in Philadelphia. Based on interviews with individuals selected at random on the streets, in pool rooms, barber shops, and other public places.

with its peak of incidence before nineteen years of age in the female and at twenty-one years in the male (Fig. 136) it is obvious that instruction regarding its dangers belongs largely in youth. That youth is not always equipped with knowledge regarding the safe course to pursue in the event of infection is well shown in Figs. 137 138 and 139 And it largely is through such ignorance that this disease offers such temptations for the druggist and the

charlatan. That so large a percentage of those interviewed should advise a visit to the druggist is by no means a great compliment to our profession A forward-looking profession owes it to itself, and to those thousands of uninformed youths who are potential victims of these diseases, to spread the real truth. In no better way can such things be combated

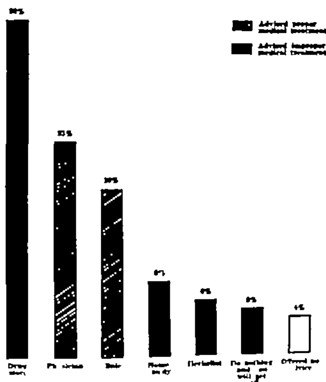


Fig 138.—Where 445 young men advised an investigator to go for venereal disease treatment in San Francisco. Based on interviews with individuals selected at random on the streets, in pool rooms, barber shops, and other public places.

Not only are young men woefully ignorant regarding this disease and syphilis but most of our young women hold opinions that add little to their safety One of the most common of these beliefs is that these diseases (particularly gonorrhea) are found only among the least cleanly of our citizens The time when young women refrained from sex experiences solely for the fear of pregnancy has passed They have not lent a deaf ear to all

of the birth control propaganda. In fact, an enormous percentage of them are no longer fearful of wrecked lives as the result of illegitimate pregnancy This change, together with the new sex freedom, has removed a deterring influence that has been a great factor in female chastity And there never was a time in which

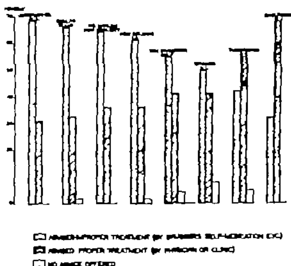


Fig 139

it was more needful that these often far greater risks than preg nancy should be frankly and truthfully revealed to them.

As Nelson and Crain have said "the first step in public education is self education." Not only must the educator know the facts but he should present them in an informative way and with-

out exaggeration. There was a day when it was widely thought that one impressed most when he frightened most, but that day, too, has gone American youth does not frighten well. It is a courageous daring group that is not greatly influenced by fear There is too much of the old pioneer spirit in it for such technic to be highly successful. It wants the plain, undistorted facts and most assuredly, it should have them Today they are being carried to it in many ways by many different social agencies all of which long for the enthusiastic assistance of the medical profession. And, as has been stated elsewhere, they are getting comparatively little real help from this quarter

The tendency of some of these earnest extramedical workers is to instill into the subject a degree of emotionalism that is not to the best interests of those whom they wish to instruct. The bare facts of these diseases are sufficiently dramatic to arrest attention without so great an appeal to feelings Feelings are such evanescent things that it is far better and more lasting for the appeal to be made to reason These appeals to feeling however have accomplished one gain. They, temporarily, have engaged public attention to the extent that there need now be no hesitancy upon the part of any physician to take his proper place in the educational campaign now in progress. No longer need he fear criticism On the contrary he can look forward to much public appreciation of his efforts at such enlightenment. To his surprise, he soon will find himself not only in demand but the recipient of much that is highly complimentary

It is the opinion of those who have studied the problem most closely that instruction regarding the facts of these diseases should be given during the early high-school years. Such instruction to adolescents of these ages is far better received when it is given by a physician. And no physician who gives such in*struction and invites questions will have reason to suspect that* he has wasted time and effort. He will leave with the conviction that he has done great good.

As an evidence of the need for such talks and the fact that they are in great public demand might be cited our experiences along such lines in Philadelphia during the last year In the

Fall of 1937 the Pennsylvania Social Hygiene Association in co-operation with a committee of the County Medical Society, decided to carry out a campaign of public education regarding the genitoinfectious diseases. As the result of this talks were given to church groups, women s clubs, men s clubs youth groups, high schools, colleges and many other bodies. At first, three speakers, of whom the writer was one, tried to fill the need. So great did the demand for speakers become that it was necessary to interest about a dozen other physicians in the work and many of them were kept quite busy The writer talked to more than 6000 people, over 90 per cent of whom were below the age of twenty one years, and finished with the feeling that he had done more real good in the one season than in any ten years of his life

Certainly it is not fair that youth should be launched upon a world such as we have today in total ignorance of things that may mean so much Nor is it fair to allow social agencies unaided by us, to bear the burden of such enlightenment. Today there is a wealth of educational material to be had that greatly aids in the giving of such talks to laymen. There are lantern slides, talking films and endless factual data within reach of all who desire them. Few of those who have had no experience in this field realize what an enormous amount of this material the American Social Hygiene Association[1] has produced for such purposes. This organization since 1913 has been carrying many of the burdens that we should have been bearing, and it stands today as a kindly bureau for aid and the dissemination of knowledge along these lines. No answerable appeal finds it lacking in helpful response The profession has no more staunch an ally and he who wants material for educational purposes will find that they have an abundance of it for all phases of the matter

[1] The American Social Hygiene Association, 50 West Fiftieth St New York, N Y

LXV FOLLOW-UP, SOURCE AND CONTACT FINDING

REGARDLESS of what individual opinion may be of the safety and wisdom of having public health nurses and social workers ferret out both the one who transmits gonorrhea and those who have been exposed to infection, we probably all will agree that the only way aside from education, to stamp out infectious diseases is to find them, and treat them until they no longer can be transmitted We, further probably all will admit that the physician is a poor one at case-finding For so many years his activities have been restricted to case-treating that he has not given much thought to the cases he does not see. True, when this disease was acquired by those who might be a menace to someone he knew and liked, he became greatly concerned about the safety of others. Just so soon as the immediate problems were solved however his general tendency was to lose his great concern for the safety of others and confine his attention to the one he was treating Some few always have made efforts to have the patient get the one who infected him under medical care but it has been rare, indeed, that our concern went beyond such an effort.

For so many years we have been thoroughly imbued with the idea that the patient s secret was ours to protect, that we largely have felt that there was no one sufficiently tactful to seek out those who transmitted and those who were exposed. This has been particularly so in the case of married patients and the sons and daughters of those we knew The highly justifiable fear of the creation of great unhappiness and the disruption of homes has made us unduly fearful in this regard Such an attitude is more particularly held by those who have been in practice many years. Many of the older of us have seen such things tried in the past with decidedly depressing results and have developed the fixation that they do more harm than good. The social worker so far as the genitoinfectious diseases are concerned has been viewed almost as a trouble-spreading busybody a being to be dreaded and avoided.

When one turns to the younger of our physicians, particularly those who have served internships in hospitals having active social service departments, he finds so little of this fixation that he wonders if the rest of us are not just a trifle archaic in this regard. Many of them are sure their older colleagues need to be psychoanalyzed or at least, have a bit of psychotherapy to erase fears that, to them, seem so lacking in real justification. Some would like nothing better than to carry out an educational campaign to modernize us. And many of us need it.

OUTBREAK OF SYPHILIS IN A RURAL COUNTY
MONROE COUNTY TENNESSEE

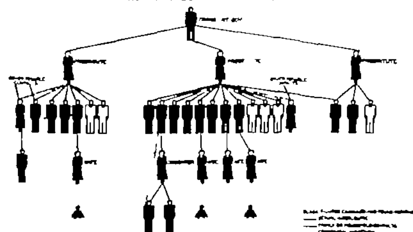


Fig 140.

In our justification it can be said with truth that these particular obsessions were born of sad experiences. Their result has been that only a comparatively small number of physicians and dispensaries call for help from public health nurses or social service workers Even in those hospitals having earnest active social service departments willing and anxious to aid us we usually have spurned their offers.

Largely those who care for gonorrhea have failed to discover that much of what they fear from these workers has little present

application to them. While we continued to hold ourselves aloof, there has developed a large army of well trained workers who know how to do things tactfully and without the precipitation of all of those dire results we mentally attributed to their activi ties. On the other hand, the syphilologists saw the light some years ago and most of them would be lost without such help Wherever they could they established a close relationship with their social service departments. Wherever possible, they have

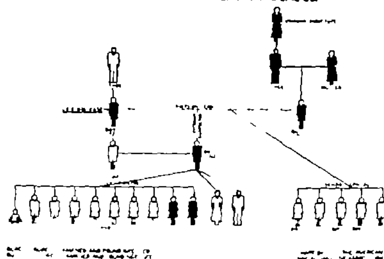


Fig. 141

their own social workers and they lose no opportunity to speak in the highest terms of their value and need.

Most of what is epidemiologically true of syphilis is equally true of gonorrhea And we would do well to overcome our in hibitions quickly and get ourselves in line with modern progress There is no justifiable reason why the individual with smallpox diphtheria or even syphilis should be searched out and gotten under treatment and control while the one with gonorrhea is allowed to spread disease as his or her opportunities permit. In many countries treatment of these two latter diseases is compul

sory upon the patient and their deliberate transfer to others is a penal offense. In our country no such conditions hold. Such being the case much of disease reduction falls upon our shoulders and we do not fulfill our whole responsibility by confining our efforts alone to those who seek us. We have almost an equal responsibility with those who do not cross our doorstep And we should welcome wholeheartedly the aid of those who today are singularly fitted to search out for us the sources from which

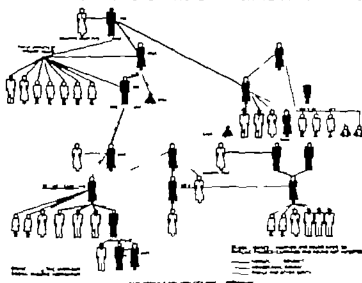


Fig. 142

our patients acquire the disease as well as those to whom they may have conveyed it, and to return to treatment those who have lapsed. In no other way can we hope to reach a full measure of the success in disease reduction that so surely could be ours. This particularly is so of dispensary service and it has many direct applications to private practice as well.

No thoughtful physician could raise the least objection to the aims of those who stand so ready to aid us in our battle against this disease that takes its toll in millions. By no one have they been outlined more pointedly and intelligently than

has been done by those two outstanding women who have had such wide experience in social service fields, Lena R. Waters and Louise B Ingraham.[1] "The objectives of a follow-up service are (1) continuous and complete treatment for every patient with syphilis and gonorrhea applying for medical care, and (2) prevention of spread of the disease by discovery of new cases, thorough group education, individual instruction, and education of practitioners in medical and social fields as to the public health approach to venereal disease control" Certainly we can have no quarrel with the first objective and we can have no just

CASE FINDING IN GONORRHEA
ALL MEMBERS OF ONE FAMILY FOUND INFECTED

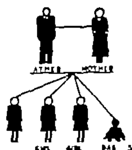


Fig. 143

disagreement with the second. We need not even smile when they speak of educating us. No one knows better than they that we need it. We might do well to start our education by reading the article these authors have written. We would learn much about these new beings that have come into our midst while we were so soundly sleeping. There are thousands of them and more thousands are in careful training Let us see what they are expected to do and what they are We can stand a few more quotations from the same source *The principal responsibilities* of a social worker in a public health clinic are education and

[1] Venereal Disease Information 19: 220, 1938

prevention. She should be equipped through education to understand the individual in his social relationships She approaches her work with respect for the freedom of the individual, the sanctity of the family, and a belief in the innate desire of each person to become a self-respecting healthy citizen. The *qualifications of a social worker should include culture, tact,* a broad general education, a psychological understanding of people.

Her personality, education and performance should be such as to win respect and co-operation of both medical and social groups in the community Why should all of this talent go in other directions while gonorrhea and those who have it go merrily on their way? And why should any of us think of such people as trouble-makers? Most assuredly they should be our good right hands

LXVI. THE CHARLATAN

DESPITE all of the laws that have been passed in many states to eliminate or restrict the activities of the charlatan he still thrives. No sooner does a state pass a law against the advertising of places where "venereal diseases" are treated, than he finds another way in which to convey the knowledge to his hoped for victims. His existence depends upon advertising and he finds many ways in which to carry it on within the law Indeed, he has devised systems that make it almost impossible for the law to reach him Often those who own the establishment do not live in the same state and most of the medical helpers immediately forget their first names Dr Jones Smith or Brown gives little upon which to establish an identification.

The sole purpose of the charlatan is to extract money from gullible human beings and he finds many ways in which to do it. His chief stock in trade is the fright element and as a maker of what we call 'neurotics" he is without a peer He is inordinately long on promises of quick cures and equally short on fulfilment. He is a specialist in all things and few, indeed are the urologists in large cities who have not seen on the same day patients on whom he had made a diagnosis of either gonorrhea or syphilis when the closest study failed to reveal the slightest suspicion of either disease From a few large cities he has been banished but in the rest of them he plies his trade unhindered and unmolested He is a blot on the good name of any community

Some years ago the writer had the decidedly rare opportunity of spending a morning in the office of one who had one of those wax works museums downstairs of the kind into which we liked to sneak in our early youth Upon the writer's arrival he was given a white coat to wear and was impressively introduced to each patient as a co-worker of the doctor's in the ——— ——— Hospital. (The doctor and the writer happened to be taking a postgraduate course there at the time) What transpired dur

ing that morning was about the only thing the scenario writers have missed It was a course in the psychology of the gullible

Fig. 144.—Banish quacks and nostrums Money spent on quacks and nostrums (patent medicines) for the treatment of venereal diseases is worse than wasted The symptoms may be driven away but only temporarily Eventually the disease may reappear too late perhaps, for the success of scientific treatment. (U S. P H. S Washington, D C)

One patient sat in front of a static machine while the wheels buzzed and nothing else happened another backed up against a

vibrating machine for a kidney treatment, another held a "vac uum electrode' to his perineum while others did equally futile things for a price All had one thing in common—they looked supremely happy at what they were doing

Finally, there appeared a farm-hand who seemed to be carry ing most of the woes of the world. After being put at some mental ease, he was asked a few questions about his symptoms. As soon as it was found that he belched frequently, he was informed that, while the examination was free it was hardly worth going further unless he intended to treat what he had. That brought up the question of cost which soon was fixed at 50 dollars until he was cured. In an undertone he was told that his medicines would be extra, which he apparently did not hear Having only 10 dollars, this was extracted and he was instructed to bring the rest at his next visit. In the most impressive of ways he was informed that he had "catarrh of the stomach" and given an out line of the dire things that would result if he neglected it. He was given an order for his medicine and a signed agreement.

After he went out the writer asked what the agreement was and how any money could be made from him if he continued to come for treatment for months. He received the following an swer "I didn t guarantee to cure him, I guaranteed to treat him until his belching stopped A little nux vomica will do that but he doesn t get any for awhile. He gets some iron and a laxative. So far as profit is concerned I would be glad to treat him for the rest of his life. His medicine will cost him from 2½ to 3 dollars a visit and it will cost me about 25 cents I'll see any patient for that. If he gets unruly I'll give him some tincture of nux and he'll have to be a perfect specimen if I can t re-fee him for an other 50 I know one of his testicles hangs lower than the other'

Many careful investigations of the means by which these gentry extract money from their victims have been made by the American Social Hygiene Association Some of the things they have revealed make the above experience seem like the doings of children. All of them have shown that the entire situation cries loudly for abolishment for public protection if for no other rea son. So glaringly do they show this that it might be well to cite just a few of the findings of these investigators.

A letter was written to an advertising charlatan stating that the writer of the letter expected to get married and would like one of the charlatan s questionnaires. This was filled out and instead of the requested "sample of urine and smear of urethral discharge," some water colored with tobacco juice and a slide upon which was spread some egg white were sent. In a few days a reply was received stating that 'Our suspicion that you suffer from gonorrhea was found to be based upon fact a microscopic examination of the smear revealed the presence of gonococci germs which have already reached a chronic stage, as is usually the case in chronic gonorrhea." (Cost guaranteed cure in two weeks, 200 dollars in advance or cure by correspondence in three months 25 dollars a month.)

A visit to a charlatan s museum resulted in the following conversation with the man in charge Attendant "You don't look well, don't be bashful tell me about yourself Don't you know what I mean? You know it is very dangerous for a man about your age You see you look as if you had gonorrhea. My advice is to go up and see the doctor at once. He won't charge you anything. We have a specialist who can tell you by looking at you what is the matter" Investigator "How can you tell I have gonorrhea? Attendant "I have been here long enough to know when a man is sick or not."

Two investigators at another museum were looking at a figure showing a man in a straight jacket. When addressed by the at tendant, they asked if a man could really go insane from self abuse The answer was, "Surelv why this one is an actual case This patient is in a Philadelphia hospital now There are hundreds of such cases in the hospital—we cure them upstairs."

A lay owner of such an office made the following statement to one whom he believed to be a colleague It is the same every where nearly all venereal cases. When the patient comes in, especially if he is a foreigner the interpreter or casemaker lands him. Of course, the patient thinks that the casemaker is a doc tor After making the financial arrangements he may turn the patient over to the real doctor—quite often he does. The treat ment, however depends upon what the patient can afford to pay It is the casemaker's and doctor's business to make the patient

pay all the traffic will bear It is a dirty business, but expenses are high and have to be met." (Philadelphia Hospital and Health Survey)

Such methods are not confined to those charlatans who have impressive offices, as one can see by a study of many newspapers and magazines, particularly the foreign language papers and those that go to the Negro population. Many of these advertisers do an enormous mail-order business. In the poorer districts these diseases are treated by countless 'herb doctors,' "chemical companies ' "witchcraft professors " "fortune tellers," specialists, ' institutes" and like things Millions of advertising pamphlets containing street guides, trolley guides and almanacs are given out on the streets every year With such things transpiring in our midst, who is there to say that this is not a free country? And who is there who will hint that what should be done about the spread of gonorrhea is being done? That such things can be done is shown by the fact that New York City has found it possible to eliminate most of these decidedly conscienceless institutions.

LXVII. BATTLEGROUND

For reasons eminently satisfying to himself and equally annoying to our Departments of Health, the physician never has taken kindly to the idea of reporting his cases of syphilis and gonorrhea. Almost, the more the compulsion that has been exerted to make him do so the poorer have been the results. Also the more wordy the compulsive efforts the more patients have been driven across state borders, into hiding into the hands of druggists who dare not report or charlatans who will not. The upshot of the entire matter is that reporting under present conditions is a virtual farce If it is to be improved it will be as the result of a far better understanding than now holds between the health authorities, the physician and the patient who has the disease. Particularly is this so where such reports require that the patient's name and address be given.

Neither the physician nor the victim of the disease has confidence in the inviolable secrecy to be obtained in such matters when the latter becomes just a card in the files of a health bureau. And it makes no difference how loudly these agencies talk about the matter neither will place confidence in the idea that these secrets are buried forever Most Boards of Health are too much under the domination of politicians to inspire great trust, without which reporting by name cannot be successful. Rather than report patients by name, no matter how great the compulsive efforts may be physicians will fail to establish a diagnosis, or at least, to give the disease a name though they treat it for what it really is And rather than subject themselves to the dangers of such reporting patients will resort to all sorts of evasive devices.

Whether or not this battleground continues to be an abiding place of suspicion and inaction on the one hand and annoyance and invective on the other depends altogether upon whether or not reason, tolerance and good sense are employed by all parties concerned. Recent history has shown us that there is not victory

in defeat. In this connection there is no reason to parade either victory or defeat. Though neither side seems to sense it to any great extent, there is more to be gained by a laying down of arms and courting the better understanding to be gained by sensible discussion. There is right and wrong on both sides of the question and, until these things have been smoothed out, there will be no reporting worth the name. Indeed, as things have been the physician sees nothing to be gained by it no matter in what form the reporting is to be done. It got off to a miserable start, aroused his antagonism and so far, has amounted to practically nothing It will take much correction, a world of enlightenment and many kind words to overcome what has been done.

The past has been decidedly unattractive and more like childish fumbling than the acts of mature humans. In the first place, the health authorities should admit the very obvious fact that force is a weapon that defeats its own purpose and that the calling of names is a poor way in which to gain co-operation There is need that they show a degree of human consideration that transcends the mere matter of statistics. There likewise is call for a continued display of interest upon their parts to the end that physicians may be interested instead of viewing such reporting as work that does no one any good, some folks harm and in which no one is vitally interested

There can be little doubt about the immense importance to social welfare of the reporting of both syphilis and gonorrhea. This is even more so under present conditions than it formerly was. After ages of secrecy these diseases at last have been brought into the open and vast sums of public funds have been allotted for their control. By an act of Congress increasing sums of money have been authorized for this purpose and most *thinking physicians are of the opinion that it is a great forward* step Most of these funds are being passed on to State Boards of Health to aid in this much-needed battle. While these increasing amounts seem to be a settled allotment for such efforts it so happens that they must be appropriated by each successive Congress In order to keep them flowing into these channels it is necessary that the Public Health Service and the State Boards of Health show each year that these moneys are being spent to

good purpose and that they are accomplishing the purpose for which they were intended.

There are but two ways to determine progress or the lack of it, so far as these diseases are concerned One is by the costly method of regional surveys and the other is by the careful reporting of every case falling into the hands of physicians. As there is nothing in the present campaign against these diseases that is against the welfare of the physician and much that adds to his economic gain, there is, aside from a truly humanitarian one, every reason why he should co-operate by reporting his cases. A careful scrutiny of the recommended program for a national campaign against these diseases will show that the physician has been considered at every turn.[1, 2] The writer had the privilege of serving upon both committees and though some of the members of these committees were raised in a public health atmosphere, which is vastly different from the usual medical approach to the problems, he encountered nothing but the utmost respect for the physician and what, by right, should be his. Indeed the prevailing thought was to make more use of his services and see that he received just compensation for those rendered. Under such circumstances, we would be shortsighted, indeed, if we failed to co-operate and to show much tolerance to the views of those who do not always visualize things as we do.

As physicians, we might do well to understand that the health officer does not always see through our eyes He is a paid public servant desirous of obtaining results and he does not enthuse over anything that stands in the way of his objective. The more interested he is in his work the more intolerant is he of what, to him, seem to be obstructive tactics. He is far less interested in the individual as a person than he is in the masses. If he is worthy of his position he has a degree of social vision that sees beyond the physician and the patient. He views them in their individual relationships to society at large. His job is to prevent disease and keep a record of what is not prevented So

Recommendations for a Venereal Disease Control in State and Local Health Departments. Report of an Advisory Committee to the U.S.P.H.S., Venereal Disease Information 17: 1, 1936.

Recommendations for a Gonorrhea Control Program, Venereal Disease Information 19: 1 1938

long as the physician plays the part he expects of him, he thinks of him as a fine citizen. When he fails to do so, this official's reaction is just what the physician's would be were things reversed. Being, in a sense, collective-minded, he sees little public virtue in a solely individualistic viewpoint. This is the way he grew up and we shall have to take him as he is

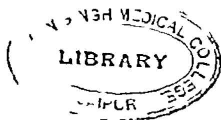
Thus we see two groups who see things from entirely different angles One has a duty prescribed by law which he cannot evade and the other has a duty often prescribed by law that he persists in evading Neither group has shown a great amount of respect and patience for the shortcomings of the other, so far as these diseases are concerned. Unquestionably, there is every reason why they should find a midground in which to settle their differences.

Much study of the problems involved has brought many to the conviction that no great good is accomplished by insisting *upon the reporting by name That this is a decided deterrent* to the patient's visits to a physician is clear to those urologists in states bordering on others where such reporting is compulsory For instance, New Jersey requires the patient's name and the public knows it. Consequently a large proportion of the cases in South Jersey who can afford it come to Philadelphia for treatment, while those in North Jersey seek treatment in New York City The nearby patients who are compelled to seek treatment in a dispensary cross one river or the other to avoid having their troubles on record in Trenton.

It is apparent that much cannot be expected of physicians when faced by a report blank requiring answers to a great variety of questions upon subjects that are of no great value to those who demand the answers. As a rule, physicians abhor desk work *and such reports more often than not defeat their own purpose* The simpler they are the more chance there is that they will be filled out. That this is not always realized by health departments *is shown by a study of the reporting blanks of many of them.* One state presents the physician with a blank measuring 8½ by 28 inches and many blanks require the answering of from 10 to 40 or more questions Usually the physician is expected to pay the postage

There are some Boards of Health that make requests that strike the physician as decidedly unfair Philadelphia asks that private patients be reported by number while the poor who frequent dispensaries must be reported by name and address. Probably this is not really intended as a class distinction but it appears like that to those who feel charitably inclined toward the poor

Thus, it is obvious that there is much on both sides of the question of case reporting that needs thoughtful attention before things will be adjusted satisfactorily Not only is it necessary to convince the physician of the great value of such statistical information to the community the state and the nation, but it is desirable to erase from the system all of the things that arouse opposition by their complexity or unfairness. The physician must be convinced that the department to which he makes his reports does more than just file them away Otherwise, he reasons that it is just so much lost effort on a thing about which no one cares. He must be made to understand that he is as much a health officer as is he who is paid by the public, that he plays a highly important part in a worthwhile measure, and that, without his aid, there is no way in which progress toward the control of these diseases can be measured Without some concrete statistical evidence of progress, the urgently needed funds may not be forthcoming each consecutive year and it is outstanding that, without such aid, things quickly will sink to that deplorably pathetic state in which they have rested far too long.



LXVIII. HISTORY TAKING KEEPING AND ANALYSIS

CONSIDERING the millions of cases of gonorrhea that have been treated by physicians throughout the centuries, it seems inconceivable that, even today, we lack base lines for the evaluation of our therapeutic endeavors. We have no definite data upon the average duration of the disease under varying conditions and treatment. We have no definite figures upon the percentages of complications that are due to the disease itself, those that occur as the result of faulty conduct upon the patient s part, or those that are precipitated by the treatment. In fact, there are so many gaps in our knowledge of the simplest clinical manifestations of this disease that, where one should find accuracy he finds only chaos

As the result of this faulty foundation it has not been possible in the past safely to analyze the results of our therapeutic experimentations This has reflected itself into a rather general looseness of clinical interpretation. Almost anyone could say that the treatment he had devised or used was far superior to any other plan. He was safe from criticism and, frequently the treatment he advised came into wide usage particularly if it was easy to follow There was no great need that it even be scientifically based It was only necessary to make a great noise about it and a temporary fame was assured

Of no other human disease can this be said and, certainly the time is here in which there should be developed such a wealth of knowledge regarding these simple things that it no longer will be possible for the easily deceived to lead others along their paths of error There is little sense in our continuing a circular mode of progression that leads mostly nowhere nor is there great credit in so ungainly a journey

As one analyzes the causes for this unfortunate state of affairs he finds that the first great fault has been a lack of deep interest in the disease and those who have it. Out of this lack of interest

has flowed a laxity of record keeping that has defied worthwhile statistical analysis to the end that reliable averages could not be struck. We have talked much about the question of control cases whereby to evaluate treatment results, but few have bothered about such things. Most have satisfied themselves with the old method of assuming that everyone knew how gonorrhea behaved —which, of course was not so—and letting that stand as a base line whereon to fool themselves and others. We should have something more substantial than personal opinion if we would court science

Unquestionably, one of the most outstanding needs in this regard is a greater uniformity in history taking and keeping In no other way can reliable base lines be made for either treat ment or epidemiologic purposes. And the first need in this regard is a history form that brings out disease data that makes accurate statistical study possible With such a form in general use these glaring faults in our present knowledge quickly could be overcome. Unfortunately we lack so much that is essential that such a form must contain many things that we heretofore have failed to record. And, yet, the end sought is worth far more to us than the extra time required for the filling out of such a form possibly could be

To fill the need for a uniform or standard history the United States Public Health Service asked the American Neisserian Medical Society to appoint a committee for such a purpose. The result of its deliberations was turned over to the statistical department of the above service to be arranged so that the items could be coded for analysis upon the punch-card machine. The result, at first glance, seems to be quite an elaborate affair but, upon closer study proves to be rather simple. It is hoped that there will be a widespread adoption of this blank. By the use of the code that accompanies it, the required data are recorded with a minimum of writing and do not add greatly to dispensary desk work.

By the aid of these data it will be possible to carry out a care ful investigation of therapeutic results under different forms of treatment in much the same way as was done by the Co-operative

Clinical Committee upon syphilis. In that study it was possible to go over older clinical records and secure the needed information. With gonorrheal records as usually taken, no such method is possible. Whatever is done along these lines must be projected studies instead of retrospective ones. Five such projected studies are now being carried out in as many large cities, but the hope is that many clinics by adopting this standard history form, will make it possible to widen the scope of these studies and more quickly arrive at a better, safer understanding of this disease. Indeed, this chapter is added solely as a plea that they do so. (These history forms can be obtained from the United States Public Health Service without cost.)

Individual Case Record Form #3, United States Public Health Service

INQUIRY INTO THE TREATMENT OF GONORRHEA IN THE MALE

I. IDENTIFICATION DATA

Source of treatment: Name of Hospital — Clinic
Private Physician
Case No. or patient's initials
Date admission — Date last visit
Color — Adm. age — Marital status — Work: light — heavy

II. HISTORY (Check applicable term)

Previous GC: Yes — No — Date
Complications (specify, use code)
Present GC infection: Date exposure — Incubation (days)
First symptoms (specify)
Alcohol at time of exposure: Yes — No
Prophylaxis: No — Yes — Mechanical — Chemical — Time elapsed hrs.
Alcohol during incubation period: Yes — No — Not known.
Sexual excitement during incubation period: Yes — No — Not known

III. HISTORY OF PREVIOUS TREATMENT FOR PRESENT GC INFECTION

None — No data — Yes — Started on basis of
(Record the details of previous treatment under Section VI and mark "history")

IV. PHYSICAL EXAMINATION (Check both positive and negative findings relative to gonorrheal infection)

Discharge: Urethra, Yes — No

	Normal	*Abnormal*		*Normal*	*Abnormal*
Genitalia			Epididymis—Rt	☐	☐
Prepuce	☐	☐	—Lt	☐	☐
Meatus	☐	☐	Vas def. —Rt	☐	☐
Tyson's glands	☐	☐	—Lt	☐	☐
Extraurethral ducts	☐	☐	Cowper's glands	☐	☐
Scrotum	☐	☐	Prostate	☐	☐
Testicle —Rt	☐	☐	*Seminal vesicles—Rt*	☐	☐
—Lt	☐	☐	—Lt	☐	☐

V. DIAGNOSIS ON ADMISSION: STAGE

(See instructions for classification. Use code)

VI LABORATORY EXAMINATION, TREATMENT AND OBSERVATION RECORD

A.		B.	C.			D	E.				F		G.	H.	I.	J	K.	L. & M.
Treatment		Treat ment period (days)	Examination, treatment or observation.			Interval (days) No ℞ or exam	Smears.				Two-glass test.		Burning or frequency	Culture.	Complement fixation.	Treatment.	Reaction to treatment.	Clinical progression or relapse. (Make entry each time patient is seen.)
Where.	By whom		Mo	Day	Yr		Urethral smear Gc	Urine sediment. Gc.	Prostatic secretion. Gc.	Pus cells per hp f.	I	II.			Gc.			

Page No.____ Indicate whether or not record continues on next sheet. Yes____ No____

____________________ Physician's signature.

____________________ Date record sent to U.S.P.H.S.

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